

E

Appendix E HCM Analysis: Post Development with Improvements



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Priority Growth Areas Mobility Study

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

Scenario 6 6 Post Development with Improvements AM
PeakReport File: Z:\...\Post Development with Improvements AM
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	SB Left	0.738	30.1	C
2	Jasper Avenue and 109 Street	Signalized	HCM 7th Edition	EB Right	1.034	93.2	F
3	104 Avenue and 109 Street	Signalized	HCM 7th Edition	NB Left	0.690	61.9	E
4	102 Avenue and 124 Street	Signalized	HCM 7th Edition	SEB Left	0.859	57.3	E
5	Stony Plain Road and 124 Street	Signalized	HCM 7th Edition	WB Left	0.679	48.7	D
6	107 Avenue and 124 Street	Signalized	HCM 7th Edition	NB Right	0.726	25.8	C
7	111 Avenue and 124 Street	Signalized	HCM 7th Edition	EB Right	0.633	28.7	C
8	118 Avenue and 124 Street	Signalized	HCM 7th Edition	EB Right	0.860	111.3	F
9	104 Avenue and 121 Street	Signalized	HCM 7th Edition	EB Left	0.515	45.1	D
10	104 Avenue and 116 Street	Signalized	HCM 7th Edition	NB Left	0.656	75.6	E
11	104 Avenue and 112 Street	Signalized	HCM 7th Edition	WB Left	0.502	43.2	D
12	Jasper Avenue and 121 Street	Signalized	HCM 7th Edition	NB Left	0.578	20.0	B
13	Jasper Avenue and 116 Street	Signalized	HCM 7th Edition	EB Right	0.900	59.4	E
14	100 Avenue and 116 Street	Signalized	HCM 7th Edition	SB Left	0.864	36.8	D
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	0.959	108.5	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	EB Left	0.725	55.3	E
19	Stony Plain Road and 158 Street	Signalized	HCM 7th Edition	NB Right	0.187	11.3	B
20	Stony Plain Road and 163 Street	Signalized	HCM 7th Edition	NB Left	0.904	72.9	E
21	95 Avenue and 156 Street	Signalized	HCM 7th Edition	SB Left	0.568	47.2	D
22	87 Avenue and Meadowlark Road	Signalized	HCM 7th Edition	EB Thru	0.815	78.9	E
23	109 Street and 82 Ave	Signalized	HCM 7th Edition	WB Right	0.865	52.9	D
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 Right	0.346	25.8	D
26	109 Street and 87 Ave	Signalized	HCM 7th Edition	NB Left	0.526	100.7	F
27	109 Street and Waltherdale Hill Road/Saskatchewan Drive	Signalized	HCM 7th Edition	EB Right	0.859	63.5	E
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	0.645	46.0	D
30	114 Street and 87 Ave	Signalized	HCM 7th Edition	WB Thru	0.657	104.0	F
31	112 Street and 82 Ave	Signalized	HCM 7th Edition	EB Left	0.585	32.2	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):	0.738

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	65	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	16	24	0	441	0	24
Total Analysis Volume [veh/h]	0	0	1006	0	65	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	42	0	0	13	0	42	0	42
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]	37	37	9	50	50
g / C, Green / Cycle	0.37	0.37	0.09	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.22	0.23	0.06	0.40	0.40
s, saturation flow rate [veh/h]	3204	1579	1539	3076	1573
c, Capacity [veh/h]	1186	584	138	1538	787
d1, Uniform Delay [s]	25.53	25.64	44.19	20.81	20.85
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]	2.27	4.71	25.55	4.43	8.43
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	0.60	0.61	0.70	0.80	0.80
d, Delay for Lane Group [s/veh]	27.80	30.35	69.74	25.24	29.28
Lane Group LOS	C	C	E	C	C
Critical Lane Group	No	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	7.07	7.48	3.30	12.15	13.36
50th-Percentile Queue Length [m/ln]	53.84	57.03	25.12	92.61	101.83
95th-Percentile Queue Length [veh/ln]	11.42	11.97	5.93	17.87	19.36
95th-Percentile Queue Length [m/ln]	87.06	91.21	45.21	136.17	147.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	28.54	0.00	30.35	69.74	0.00	26.47	0.00	29.28
Movement LOS			C		C	E		C		C
d_A, Approach Delay [s/veh]	28.65					28.75				
Approach LOS	C					C				
d_I, Intersection Delay [s/veh]	30.12									
Intersection LOS	C									
Intersection V/C	0.738									

Emissions

Vehicle Kilometers Traveled [km/h]	114.11	57.05	22.65	286.87	147.17
Stops [stops/h]	508.70	269.42	118.66	875.04	481.11
Fuel consumption [L/h]	37.56	19.82	10.03	70.81	39.01
CO [g/h]	693.57	365.96	185.16	1307.64	720.41
NOx [g/h]	134.94	71.20	36.02	254.42	140.17
VOC [g/h]	160.74	84.81	42.91	303.06	166.96

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	3.094	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]	740	1000
d_b, Bicycle Delay [s]	19.85	12.50
I_b,int, Bicycle LOS Score for Intersection	2.153	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	44	0	0	0	0	0	44	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]	38	38	38
g / C, Green / Cycle	0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.33	0.16	0.01
s, saturation flow rate [veh/h]	1683	1293	1373
c, Capacity [veh/h]	640	491	522
d1, Uniform Delay [s]	28.58	22.40	19.40
k, delay calibration	0.33	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	9.89	0.56	0.02
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	0.86	0.41	0.02
d, Delay for Lane Group [s/veh]	38.47	22.95	19.42
Lane Group LOS	D	C	B
Critical Lane Group	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.46	3.46	0.19
50th-Percentile Queue Length [m/ln]	102.59	26.34	1.45
95th-Percentile Queue Length [veh/ln]	19.48	6.22	0.34
95th-Percentile Queue Length [m/ln]	148.44	47.41	2.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	38.47	0.00	22.95	0.00	0.00	0.00	19.42	0.00
Movement LOS			D		C				B	
d_A, Approach Delay [s/veh]	34.29					19.42				
Approach LOS	C					B				
d_I, Intersection Delay [s/veh]	30.12									
Intersection LOS	C									
Intersection V/C	0.738									

Emissions

Vehicle Kilometers Traveled [km/h]	202.49	74.60	0.91
Stops [stops/h]	484.68	124.43	6.85
Fuel consumption [L/h]	46.46	13.48	0.43
CO [g/h]	857.99	248.90	8.03
NOx [g/h]	166.93	48.43	1.56
VOC [g/h]	198.85	57.68	1.86

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]	760	760
d_b, Bicycle Delay [s]	19.22	19.36
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]	1	44	0	0	13	0	44	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]	38	41	9	38
g / C, Green / Cycle	0.38	0.41	0.09	0.38
(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]	109	656	129	377
d1, Uniform Delay [s]	48.43	21.61	43.47	20.09
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]	5.91	0.33	14.64	0.13
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	0.63	0.36	0.53	0.11
d, Delay for Lane Group [s/veh]	54.34	21.94	58.11	20.22
Lane Group LOS	D	C	E	C
Critical Lane Group	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.89	3.87	2.12	0.66
50th-Percentile Queue Length [m/ln]	14.43	29.47	16.15	5.00
95th-Percentile Queue Length [veh/ln]	3.41	6.96	3.81	1.18
95th-Percentile Queue Length [m/ln]	25.97	53.05	29.06	9.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.34	21.94	0.00	0.00	58.11	0.00	20.22	0.00	0.00	0.00
Movement LOS	D	C			E		C			
d_A, Approach Delay [s/veh]	34.59					20.22				
Approach LOS	C					C				
d_I, Intersection Delay [s/veh]	30.12									
Intersection LOS	C									
Intersection V/C	0.738									

Emissions

Vehicle Kilometers Traveled [km/h]	12.03	40.79	11.85	3.28
Stops [stops/h]	68.17	139.25	76.28	23.62
Fuel consumption [L/h]	5.56	10.96	5.88	1.51
CO [g/h]	102.70	202.36	108.63	27.91
NOx [g/h]	19.98	39.37	21.13	5.43
VOC [g/h]	23.80	46.90	25.18	6.47

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]	18.80	15.27
d_p, Pedestrian Delay [s]	36.98	36.98
I_p,int, Pedestrian LOS Score for Intersectio	2.420	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]	780	760
d_b, Bicycle Delay [s]	18.61	19.64
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):	93.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.034

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	83	96	1174	49	140	969	682	148	419	113
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	21	24	294	12	35	242	171	37	105	28
Total Analysis Volume [veh/h]	265	681	83	96	1174	49	140	969	682	148	419	113
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	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	1	0	5	1	0	2	4	0	3	4	0
Auxiliary Signal Groups												
Maximum Green [s]	9	30	0	9	30	0	6	38	0	6	38	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	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	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	4.0	0.0	1.0	4.0	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]	12	33	0	12	33	0	14	41	0	14	41	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	25	0	5	25	0	5	26	0	5	26	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		No	Yes		No	Yes	
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	R	L	C	C	L	C	C	R	L	C	R
C, Calculated Cycle Length [s]	100	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	3.00	5.00	5.00	6.00	6.00	6.00	6.00	3.00	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	0.00
l2, Clearance Lost Time [s]	0.00	3.00	3.00	1.00	3.00	3.00	0.00	4.00	4.00	4.00	1.00	4.00	4.00
g_i, Effective Green Time [s]	40	28	28	9	28	28	49	38	38	38	52	38	38
g / C, Green / Cycle	0.40	0.28	0.28	0.09	0.28	0.28	0.49	0.38	0.38	0.38	0.52	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.39	0.22	0.07	0.06	0.26	0.27	0.19	0.42	0.47	0.58	0.13	0.13	0.10
s, saturation flow rate [veh/h]	686	3076	1169	1539	3076	1547	742	1329	1190	924	1134	3204	1091
c, Capacity [veh/h]	273	857	326	142	857	431	401	500	448	348	589	1207	411
d1, Uniform Delay [s]	37.78	33.42	27.70	43.95	35.28	35.58	15.25	31.17	31.17	28.09	13.29	22.36	21.18
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.11	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	1.00	1.00
d2, Incremental Delay [s]	47.50	7.52	1.88	22.95	19.55	35.23	2.38	78.57	124.5	254.9	0.22	0.79	1.65
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	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	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	1.00

Lane Group Results

X, volume / capacity	0.97	0.79	0.25	0.68	0.94	0.96	0.35	1.12	1.24	1.54	0.25	0.35	0.28
d, Delay for Lane Group [s/veh]	85.28	40.94	29.58	66.90	54.84	70.80	17.64	109.7	155.7	282.9	13.51	23.15	22.83
Lane Group LOS	F	D	C	E	D	E	B	F	F	F	B	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	7.99	8.37	1.68	3.19	11.69	13.93	2.04	22.46	25.85	31.88	1.86	3.66	1.99
50th-Percentile Queue Length [m/ln]	60.92	63.78	12.80	24.29	89.04	106.14	15.52	171.1	196.9	242.9	14.15	27.93	15.19
95th-Percentile Queue Length [veh/ln]	12.63	13.12	3.02	5.74	17.29	20.05	3.67	32.64	38.96	51.40	3.34	6.60	3.59
95th-Percentile Queue Length [m/ln]	96.25	99.94	23.04	43.73	131.76	152.78	27.93	248.6	296.8	391.6	25.47	50.27	27.34

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	85.28	40.94	29.58	66.90	59.82	70.80	17.64	129.07	257.69	13.51	23.15	22.83
Movement LOS	F	D	C	E	E	E	B	F	F	B	C	C
d_A, Approach Delay [s/veh]	51.44			60.74			168.49			21.00		
Approach LOS	D			E			F			C		
d_I, Intersection Delay [s/veh]	93.19											
Intersection LOS	F											
Intersection V/C	1.034											

Emissions

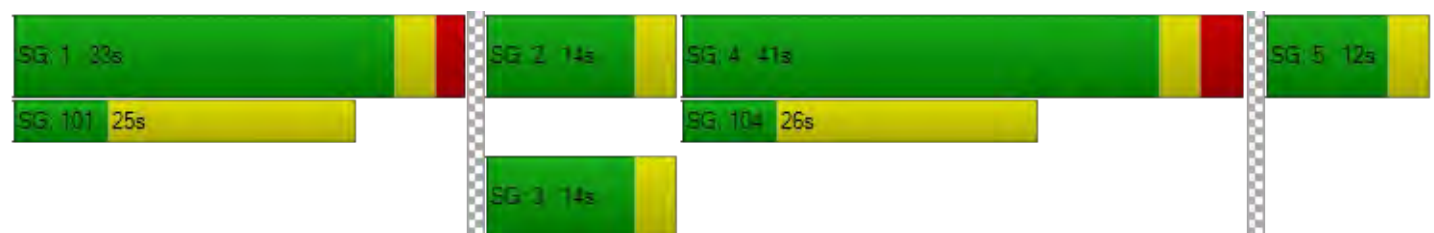
Vehicle Kilometers Traveled [km/h]	61.87	159.00	19.38	13.97	117.52	60.48	96.58	387.7	382.5	368.7	16.09	45.56	12.29
Stops [stops/h]	287.79	602.66	60.49	114.77	841.35	501.45	73.30	808.6	930.4	1147.	66.84	263.87	71.76
Fuel consumption [L/h]	29.75	50.12	5.09	8.85	64.16	39.66	12.74	102.5	123.7	177.3	4.21	16.09	4.32
CO [g/h]	549.31	925.51	94.02	163.43	1184.76	732.41	235.1	1893.	2285.	3274.	77.68	297.14	79.78
NOx [g/h]	106.88	180.07	18.29	31.80	230.51	142.50	45.76	368.4	444.7	637.0	15.11	57.81	15.52
VOC [g/h]	127.31	214.50	21.79	37.88	274.58	169.74	54.51	438.8	529.7	758.8	18.00	68.86	18.49

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]	0.82			4.93			9.83			10.49		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	3.059			2.926			3.104			2.722		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	560			560			700			700		
d_b, Bicycle Delay [s]	25.92			25.92			21.13			21.13		
I_b,int, Bicycle LOS Score for Intersection	2.415			2.288			3.093			2.130		
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):	61.9
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

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	33	159	1218	12	89	706	231	0	256	197
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	58	0	64	49
Total Analysis Volume [veh/h]	163	634	33	159	1218	12	89	706	231	0	256	197
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	81	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	26	59	0	26	59	0	19	65	0	0	46	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]	19	47	47	19	47	47	13	53	53	34	34
g / C, Green / Cycle	0.13	0.31	0.31	0.13	0.31	0.31	0.09	0.35	0.35	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.11	0.15	0.15	0.11	0.27	0.27	0.06	0.29	0.31	0.09	0.16
s, saturation flow rate [veh/h]	1476	2951	1485	1476	2951	1537	1476	1683	1469	2951	1245
c, Capacity [veh/h]	187	925	465	187	925	482	128	595	519	669	282
d1, Uniform Delay [s]	64.30	41.57	41.73	64.11	48.69	48.76	66.58	44.20	45.14	49.11	52.02
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]	39.02	1.76	3.61	35.72	11.23	19.62	26.88	12.14	17.17	1.66	13.42
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
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	0.87	0.48	0.49	0.85	0.87	0.88	0.70	0.82	0.86	0.38	0.70
d, Delay for Lane Group [s/veh]	103.32	43.32	45.35	99.83	59.92	68.38	93.45	56.34	62.31	50.77	65.44
Lane Group LOS	F	D	D	F	E	E	F	E	E	D	E
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.16	6.87	7.33	7.82	15.72	17.57	4.28	18.55	17.96	4.26	7.74
50th-Percentile Queue Length [m/ln]	62.16	52.37	55.88	59.57	119.81	133.89	32.63	141.33	136.88	32.46	59.01
95th-Percentile Queue Length [veh/ln]	12.84	11.17	11.77	12.40	22.23	24.45	7.68	25.61	24.91	7.64	12.31
95th-Percentile Queue Length [m/ln]	97.85	85.13	89.72	94.51	169.36	186.27	58.49	195.15	189.85	58.25	93.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	103.32	43.94	45.35	99.83	62.77	68.38	93.45	58.18	62.31	0.00	50.77	65.44
Movement LOS	F	D	D	F	E	E	F	E	E		D	E
d_A, Approach Delay [s/veh]	55.66			67.06			62.17			57.15		
Approach LOS	E			E			E			E		
d_I, Intersection Delay [s/veh]	61.93											
Intersection LOS	E											
Intersection V/C	0.690											

Emissions

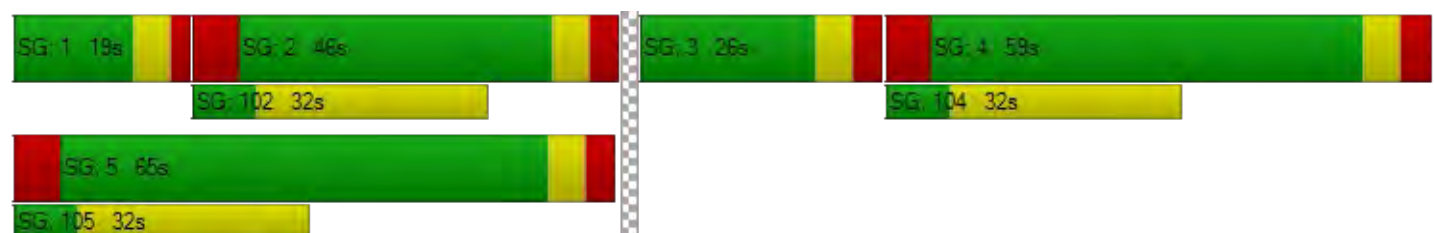
Vehicle Kilometers Traveled [km/h]	72.78	196.65	101.16	33.54	170.42	89.06	22.95	126.05	115.57	58.91	45.33
Stops [stops/h]	195.77	329.87	175.99	187.61	754.71	421.70	102.76	445.14	431.13	204.44	185.85
Fuel consumption [L/h]	24.29	40.81	21.49	19.63	70.43	40.17	10.89	43.19	42.18	20.20	18.41
CO [g/h]	448.48	753.52	396.77	362.39	1300.47	741.71	201.18	797.57	778.84	373.05	339.98
NOx [g/h]	87.26	146.61	77.20	70.51	253.02	144.31	39.14	155.18	151.53	72.58	66.15
VOC [g/h]	103.94	174.63	91.95	83.99	301.40	171.90	46.63	184.84	180.50	86.46	78.79

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]	6.01			6.72			9.98			9.62		
d_p, Pedestrian Delay [s]	64.40			64.40			64.40			64.40		
I_p,int, Pedestrian LOS Score for Intersectio	2.955			2.956			2.656			2.630		
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]	627			627			707			453		
d_b, Bicycle Delay [s]	35.36			35.36			31.36			44.85		
I_b,int, Bicycle LOS Score for Intersection	2.018			2.324			2.425			1.950		
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 StreetControl Type:
Analysis Method:
Analysis Period:Signalized
HCM 7th Edition
15 minutesDelay (sec / veh): 57.3
Level Of Service: E
Volume to Capacity (v/c): 0.859**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	1	0	0	0	1	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	50.00	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]	593	0	241	0	0	0	0	414	0	269
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	27
Total Hourly Volume [veh/h]	593	0	241	0	0	0	0	414	0	269
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]	148	0	60	0	0	0	0	104	0	67
Total Analysis Volume [veh/h]	593	0	241	0	0	0	0	414	0	269
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	0.0	0.0	0.0	1.0	0.0	1.0
Detector Length [m]	5.0	0.0	5.0	0.0	0.0	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]	34	0	34	0	34	0	0	34	0	27
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		
Maximum Recall	No		No					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	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]	43	43	43	29	29
g / C, Green / Cycle	0.43	0.43	0.43	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.29	0.44	0.16	0.20	0.23
s, saturation flow rate [veh/h]	1025	671	1532	1683	1478
c, Capacity [veh/h]	328	302	659	488	429
d1, Uniform Delay [s]	37.74	37.74	19.28	31.62	32.78
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]	30.11	47.39	1.57	8.11	14.26
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	0.90	0.98	0.37	0.70	0.80
d, Delay for Lane Group [s/veh]	67.84	85.13	20.85	39.73	47.04
Lane Group LOS	E	F	C	D	D
Critical Lane Group	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.44	8.67	3.98	8.29	9.15
50th-Percentile Queue Length [m/ln]	56.70	66.05	30.30	63.19	69.76
95th-Percentile Queue Length [veh/ln]	11.91	13.50	7.16	13.01	14.12
95th-Percentile Queue Length [m/ln]	90.78	102.85	54.54	99.17	107.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	76.49	0.00	20.85	0.00	0.00	0.00	0.00	41.01	0.00	47.04
Movement LOS	E		C					D		D
d_A, Approach Delay [s/veh]	60.41					43.39				
Approach LOS	E					D				
d_I, Intersection Delay [s/veh]	57.34									
Intersection LOS	E									
Intersection V/C	0.859									

Emissions

Vehicle Kilometers Traveled [km/h]	43.62	43.62	35.45	146.78	146.78
Stops [stops/h]	267.85	312.07	143.16	298.53	329.57
Fuel consumption [L/h]	25.65	30.59	10.45	31.11	33.73
CO [g/h]	473.68	564.88	193.06	574.52	622.91
NOx [g/h]	92.16	109.90	37.56	111.78	121.20
VOC [g/h]	109.78	130.92	44.74	133.15	144.37

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	0.00	12.62
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	10.16
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	2.806	2.897
Crosswalk LOS	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	860	580
d_b, Bicycle Delay [s]	16.25	25.21
I_b,int, Bicycle LOS Score for Intersection	2.248	2.145
Bicycle LOS	B	B

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	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					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name						WB Bike Lane				
Base Volume Input [veh/h]	268	0	0	0	1122	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	112	0	0	0	0	0
Total Hourly Volume [veh/h]	268	0	0	0	1122	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]	67	0	0	0	281	0	0	0	3	0
Total Analysis Volume [veh/h]	268	0	0	0	1122	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	Permissiv	Overlap	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	3	0	0	3	3	0	0	0	4	0
Auxiliary Signal Groups	3,4			3,4	3,4					
Maximum Green [s]	26	0	0	26	26	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	7	0	0	0	7	0
Pedestrian Clearance [s]	15	0	0	15	15	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]	27	0	0	27	27	0	0	0	25	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-
Minimum Green [s]	10	0	0	10	10	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	
Maximum Recall	Yes				Yes				Yes	
Pedestrian Recall	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]	47	47	20
g / C, Green / Cycle	0.47	0.47	0.20
(v / s)_i Volume / Saturation Flow Rate	0.49	0.49	0.01
s, saturation flow rate [veh/h]	1405	1415	1373
c, Capacity [veh/h]	731	665	275
d1, Uniform Delay [s]	27.05	26.25	32.26
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	23.18	47.15	0.27
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	0.95	1.04	0.04
d, Delay for Lane Group [s/veh]	50.23	73.40	32.53
Lane Group LOS	D	F	C
Critical Lane Group	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	20.04	23.37	0.23
50th-Percentile Queue Length [m/ln]	152.73	178.08	1.79
95th-Percentile Queue Length [veh/ln]	27.39	32.35	0.42
95th-Percentile Queue Length [m/ln]	208.68	246.53	3.22

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.23	0.00	0.00	0.00	64.58	0.00	0.00	0.00	32.53	0.00
Movement LOS	D				E				C	
d_A, Approach Delay [s/veh]	61.81					32.53				
Approach LOS	E					C				
d_I, Intersection Delay [s/veh]	57.34									
Intersection LOS	E									
Intersection V/C	0.859									

Emissions

Vehicle Kilometers Traveled [km/h]	189.34	189.34	1.19
Stops [stops/h]	721.56	841.33	8.45
Fuel consumption [L/h]	61.09	76.18	0.58
CO [g/h]	1128.07	1406.68	10.69
NOx [g/h]	219.48	273.69	2.08
VOC [g/h]	261.44	326.01	2.48

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]	12.29	39.08
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	3.160	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]	940	400
d_b, Bicycle Delay [s]	14.05	32.19
I_b,int, Bicycle LOS Score for Intersection	4.038	1.560
Bicycle LOS	D	A

Intersection Setup

Name						EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration	1					1				
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	12	0	0	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	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	12	0	0	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	3	0	0	0	13	0	0	0
Total Analysis Volume [veh/h]	0	0	12	0	0	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	25	0	0	0	25	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]	20	20
g / C, Green / Cycle	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.01	0.04
s, saturation flow rate [veh/h]	1683	1224
c, Capacity [veh/h]	337	72
d1, Uniform Delay [s]	32.23	35.67
k, delay calibration	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.20	47.19
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	0.04	0.72
d, Delay for Lane Group [s/veh]	32.43	82.85
Lane Group LOS	C	F
Critical Lane Group	No	No
50th-Percentile Queue Length [veh/ln]	0.26	2.06
50th-Percentile Queue Length [m/ln]	1.94	15.71
95th-Percentile Queue Length [veh/ln]	0.46	3.71
95th-Percentile Queue Length [m/ln]	3.50	28.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	32.43	0.00	0.00	0.00	82.85	0.00	0.00	0.00
Movement LOS			C				F			
d_A, Approach Delay [s/veh]	32.43					82.85				
Approach LOS	C					F				
d_I, Intersection Delay [s/veh]	57.34									
Intersection LOS	E									
Intersection V/C	0.859									

Emissions

Vehicle Kilometers Traveled [km/h]	1.88	5.76
Stops [stops/h]	9.18	74.22
Fuel consumption [L/h]	0.63	5.53
CO [g/h]	11.66	102.14
NOx [g/h]	2.27	19.87
VOC [g/h]	2.70	23.67

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]	193.84	23.05
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	1.725	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]	400	400
d_b, Bicycle Delay [s]	32.00	32.85
I_b,int, Bicycle LOS Score for Intersection	1.579	1.560
Bicycle LOS	A	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):	48.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

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	39	50	582	3	0	500	195	4	131	31
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	10	13	146	1	0	125	49	1	33	8
Total Analysis Volume [veh/h]	75	558	39	50	582	3	0	500	195	4	131	31
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]	9	38	0	9	38	0	0	62	0	11	73	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]	40	31	31	40	31	31	56	6	67
g / C, Green / Cycle	0.33	0.26	0.26	0.33	0.26	0.26	0.47	0.05	0.56
(v / s)_i Volume / Saturation Flow Rate	0.09	0.19	0.20	0.06	0.19	0.19	0.44	0.00	0.10
s, saturation flow rate [veh/h]	875	1550	1480	868	1550	1544	1580	1476	1614
c, Capacity [veh/h]	247	400	382	237	400	399	737	74	901
d1, Uniform Delay [s]	30.09	40.98	41.24	29.80	40.69	40.71	30.47	54.30	13.01
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]	3.15	12.35	14.08	2.02	11.18	11.30	21.74	1.39	0.44
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	0.30	0.75	0.77	0.21	0.73	0.73	0.94	0.05	0.18
d, Delay for Lane Group [s/veh]	33.24	53.32	55.31	31.82	51.87	52.01	52.21	55.69	13.45
Lane Group LOS	C	D	E	C	D	D	D	E	B
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	1.74	9.53	9.54	1.13	9.11	9.11	22.87	0.14	2.23
50th-Percentile Queue Length [m/ln]	13.26	72.64	72.67	8.62	69.40	69.39	174.28	1.10	17.01
95th-Percentile Queue Length [veh/ln]	3.13	14.60	14.60	2.04	14.06	14.06	30.71	0.26	4.02
95th-Percentile Queue Length [m/ln]	23.87	111.22	111.26	15.51	107.11	107.11	234.04	1.97	30.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.24	54.24	55.31	31.82	51.94	52.01	0.00	52.21	52.21	55.69	13.45	13.45
Movement LOS	C	D	E	C	D	D		D	D	E	B	B
d_A, Approach Delay [s/veh]	51.96			50.35			52.21			14.46		
Approach LOS	D			D			D			B		
d_I, Intersection Delay [s/veh]	48.70											
Intersection LOS	D											
Intersection V/C	0.679											

Emissions

Vehicle Kilometers Traveled [km/h]	32.24	129.64	126.96	22.78	133.36	133.15	215.76	1.37	55.45
Stops [stops/h]	52.21	285.99	286.10	33.93	273.22	273.21	686.14	4.31	66.97
Fuel consumption [L/h]	6.16	31.14	31.08	4.15	30.51	30.50	63.87	0.40	8.46
CO [g/h]	113.73	574.97	573.97	76.70	563.44	563.28	1179.36	7.36	156.14
NOx [g/h]	22.13	111.87	111.67	14.92	109.63	109.59	229.46	1.43	30.38
VOC [g/h]	26.36	133.26	133.02	17.78	130.58	130.55	273.33	1.71	36.19

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]	10.29		16.07		16.16		15.92
d_p, Pedestrian Delay [s]	49.50		49.50		49.50		49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.618		2.561		2.253		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]	517		517		933		1117
d_b, Bicycle Delay [s]	33.00		33.00		17.07		11.70
I_b,int, Bicycle LOS Score for Intersection	2.117		2.083		2.739		1.838
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):	25.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

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	118	160	445	107	0	1506	220	0	556	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]	66	148	30	40	111	27	0	377	55	0	139	17
Total Analysis Volume [veh/h]	264	591	118	160	445	107	0	1506	220	0	556	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	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	27	0	10	27	0	0	40	0	0	40	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	10	56	0	10	56	0	0	34	0	0	34	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	27	0	7	27	0	0	15	0	0	15	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]	41	31	31	39	31	31	49	49	49	49
g / C, Green / Cycle	0.41	0.31	0.31	0.39	0.31	0.31	0.49	0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.25	0.20	0.20	0.17	0.15	0.15	0.43	0.14	0.16	0.04
s, saturation flow rate [veh/h]	1036	1870	1748	953	1870	1736	3503	1566	3475	1589
c, Capacity [veh/h]	428	582	544	357	582	540	1713	766	1699	777
d1, Uniform Delay [s]	23.97	29.48	29.55	1.81	27.99	28.05	22.91	15.16	15.55	13.63
k, delay calibration	0.50	0.11	0.11	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]	6.50	1.12	1.22	0.88	0.64	0.70	6.80	0.95	0.51	0.21
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	0.62	0.63	0.63	0.45	0.49	0.49	0.88	0.29	0.33	0.08
d, Delay for Lane Group [s/veh]	30.47	30.60	30.77	2.69	28.63	28.75	29.71	16.10	16.06	13.84
Lane Group LOS	C	C	C	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]	4.94	7.53	7.13	0.09	5.55	5.22	16.50	3.08	3.85	0.82
50th-Percentile Queue Length [m/ln]	37.60	57.36	54.31	0.66	42.26	39.80	125.70	23.45	29.33	6.26
95th-Percentile Queue Length [veh/ln]	8.58	12.03	11.51	0.16	9.41	8.97	23.16	5.54	6.93	1.48
95th-Percentile Queue Length [m/ln]	65.37	91.64	87.67	1.20	71.70	68.37	176.45	42.21	52.80	11.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.47	30.67	30.77	2.69	28.67	28.75	0.00	29.71	16.10	0.00	16.06	13.84
Movement LOS	C	C	C	A	C	C		C	B		B	B
d_A, Approach Delay [s/veh]	30.62			22.85			27.98			15.83		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	25.84											
Intersection LOS	C											
Intersection V/C	0.726											

Emissions

Vehicle Kilometers Traveled [km/h]	120.27	166.24	156.75	141.42	251.70	236.21	360.13	52.61	159.75	18.96
Stops [stops/h]	177.66	270.98	256.59	3.14	199.67	188.05	1187.70	110.78	277.16	29.59
Fuel consumption [L/h]	21.62	30.50	28.83	13.86	34.71	32.61	95.38	10.22	28.30	3.17
CO [g/h]	399.30	563.15	532.30	255.89	640.90	602.18	1761.18	188.72	522.53	58.57
NOx [g/h]	77.69	109.57	103.57	49.79	124.69	117.16	342.66	36.72	101.67	11.40
VOC [g/h]	92.54	130.52	123.37	59.30	148.53	139.56	408.17	43.74	121.10	13.57

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]	36.24			63.49			71.33			42.89		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.659			2.600			3.003			2.875		
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]	920			920			480			480		
d_b, Bicycle Delay [s]	14.58			14.58			28.88			28.88		
I_b,int, Bicycle LOS Score for Intersection	2.372			2.156			3.002			2.079		
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):	28.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

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	148	133	543	72	0	1459	94	42	809	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]	69	108	37	33	136	18	0	365	24	11	202	13
Total Analysis Volume [veh/h]	274	431	148	133	543	72	0	1459	94	42	809	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	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	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]	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]	1003	1765	1598	1016	1840	1757	3475	1761	1002	1620	1569
c, Capacity [veh/h]	382	549	497	402	573	547	1317	667	437	795	769
d1, Uniform Delay [s]	24.16	28.63	28.69	20.10	28.60	28.64	27.47	27.32	17.08	16.15	16.18
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]	7.70	0.87	1.02	2.19	0.82	0.88	4.79	8.60	6.72	1.51	1.57
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	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	0.72	0.55	0.56	0.33	0.55	0.55	0.79	0.78	0.63	0.40	0.40
d, Delay for Lane Group [s/veh]	31.87	29.50	29.71	22.29	29.41	29.52	32.27	35.91	23.80	17.66	17.75
Lane Group LOS	C	C	C	C	C	C	C	D	C	B	B
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.00	6.05	5.56	2.18	6.25	6.03	11.42	12.08	4.47	4.78	4.67
50th-Percentile Queue Length [m/ln]	38.11	46.07	42.39	16.63	47.66	45.96	87.03	92.03	34.10	36.39	35.62
95th-Percentile Queue Length [veh/ln]	8.67	10.08	9.43	3.93	10.36	10.06	16.96	17.78	7.94	8.36	8.22
95th-Percentile Queue Length [m/ln]	66.06	76.80	71.86	29.93	78.91	76.65	129.26	135.47	60.53	63.70	62.64

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.87	29.56	29.71	22.29	29.46	29.52	0.00	33.33	35.91	23.80	19.46	17.75
Movement LOS	C	C	C	C	C	C		C	D	C	B	B
d_A, Approach Delay [s/veh]	30.33			28.19			33.48			19.56		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	28.74											
Intersection LOS	C											
Intersection V/C	0.633											

Emissions

Vehicle Kilometers Traveled [km/h]	242.18	267.25	244.52	168.95	398.25	382.97	297.14	148.57	108.02	124.89	121.76
Stops [stops/h]	180.06	217.65	200.25	78.55	225.15	217.14	822.34	434.81	161.08	171.93	168.30
Fuel consumption [L/h]	33.81	37.18	34.09	20.12	50.05	48.17	72.45	38.21	18.94	20.07	19.60
CO [g/h]	624.28	686.57	629.46	371.54	924.14	889.40	1337.88	705.58	349.73	370.61	362.00
NOx [g/h]	121.46	133.58	122.47	72.29	179.80	173.05	260.30	137.28	68.04	72.11	70.43
VOC [g/h]	144.68	159.12	145.88	86.11	214.18	206.13	310.07	163.52	81.05	85.89	83.90

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]	36.93			64.52			61.61			64.73		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.797			2.566			3.054			2.976		
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	2.276			2.182			2.419			2.060		
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):	111.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.860

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]	8	36	36	0	36	0	0	45	0	11	45	45
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]	38	38	30	30	39	39	39	50	50	50
g / C, Green / Cycle	0.38	0.38	0.30	0.30	0.39	0.39	0.39	0.50	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.12	0.10	0.05	0.51	0.55	0.09	0.25	0.25
s, saturation flow rate [veh/h]	2495	1621	1146	1825	613	1870	1728	516	1870	1792
c, Capacity [veh/h]	904	616	284	548	199	729	674	271	935	896
d1, Uniform Delay [s]	22.66	22.30	37.80	27.36	33.01	30.50	30.50	21.16	16.61	16.64
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]	1.26	1.66	5.99	1.75	1.60	145.68	191.01	1.28	1.87	1.97
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	0.39	0.36	0.49	0.35	0.15	1.30	1.40	0.16	0.49	0.50
d, Delay for Lane Group [s/veh]	23.92	23.96	43.79	29.11	34.61	176.18	221.51	22.44	18.48	18.61
Lane Group LOS	C	C	D	C	C	F	F	C	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.96	4.00	3.61	3.79	0.69	46.26	51.24	0.59	7.22	6.99
50th-Percentile Queue Length [m/ln]	22.55	30.47	27.54	28.87	5.26	352.53	390.41	4.50	55.01	53.23
95th-Percentile Queue Length [veh/ln]	5.33	7.20	6.51	6.82	1.24	67.80	77.05	1.06	11.63	11.32
95th-Percentile Queue Length [m/ln]	40.58	54.84	49.57	51.96	9.47	516.61	587.15	8.10	88.59	86.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.92	23.96	23.96	43.79	29.11	29.11	34.61	193.42	221.51	22.44	18.53	18.61
Movement LOS	C	C	C	D	C	C	C	F	F	C	B	B
d_A, Approach Delay [s/veh]	23.94			35.32			196.26			18.72		
Approach LOS	C			D			F			B		
d_I, Intersection Delay [s/veh]	111.31											
Intersection LOS	F											
Intersection V/C	0.860											

Emissions

Vehicle Kilometers Traveled [km/h]	447.14	284.54	9.66	13.17	8.85	279.91	279.14	11.77	123.72	119.14
Stops [stops/h]	213.03	143.95	130.11	136.39	24.85	1665.50	1844.46	21.26	259.89	251.47
Fuel consumption [L/h]	53.81	34.44	8.56	8.60	2.20	192.80	229.44	2.36	24.18	23.36
CO [g/h]	993.62	635.91	158.06	158.73	40.60	3560.24	4236.80	43.53	446.59	431.38
NOx [g/h]	193.32	123.72	30.75	30.88	7.90	692.69	824.33	8.47	86.89	83.93
VOC [g/h]	230.28	147.38	36.63	36.79	9.41	825.12	981.92	10.09	103.50	99.98

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]	31.89	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	2.494	2.161	3.206	3.149
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]	760	600	780	1000
d_b, Bicycle Delay [s]	19.22	24.50	18.61	12.50
I_b,int, Bicycle LOS Score for Intersection	2.543	2.109	3.182	2.354
Bicycle LOS	B	B	C	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):	45.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.515

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	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	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	38	170	160	15	37	444	13	6	169	25
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	10	43	40	4	9	111	3	2	42	6
Total Analysis Volume [veh/h]	0	106	38	170	160	15	37	444	13	6	169	25
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	Protecte	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	27	60	0	16	44	0	16	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	C	L	C	R	L	C	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	4.00	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
l2, Clearance Lost Time [s]	5.00	2.00	5.00	5.00	3.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	26	23	53	53	11	38	11	38	38
g / C, Green / Cycle	0.22	0.19	0.44	0.44	0.09	0.32	0.09	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.10	0.12	0.10	0.01	0.03	0.27	0.00	0.10	0.02
s, saturation flow rate [veh/h]	1435	1476	1550	1317	1476	1668	1476	1683	1272
c, Capacity [veh/h]	341	283	685	582	135	528	135	533	403
d1, Uniform Delay [s]	40.92	44.31	20.86	18.90	50.78	38.59	49.71	31.14	28.51
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]	3.80	9.11	0.80	0.08	4.93	17.09	0.62	1.56	0.30
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	0.42	0.60	0.23	0.03	0.27	0.87	0.04	0.32	0.06
d, Delay for Lane Group [s/veh]	44.72	53.42	21.66	18.98	55.71	55.68	50.32	32.70	28.81
Lane Group LOS	D	D	C	B	E	E	D	C	C
Critical Lane Group	Yes	Yes	No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	4.07	5.33	2.95	0.25	1.22	15.00	0.19	3.96	0.54
50th-Percentile Queue Length [m/ln]	31.01	40.61	22.47	1.91	9.32	114.30	1.43	30.17	4.10
95th-Percentile Queue Length [veh/ln]	7.33	9.12	5.31	0.45	2.20	21.35	0.34	7.13	0.97
95th-Percentile Queue Length [m/ln]	55.83	69.46	40.45	3.44	16.78	162.70	2.58	54.30	7.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.72	44.72	44.72	53.42	21.66	18.98	55.71	55.68	55.68	50.32	32.70	28.81
Movement LOS	D	D	D	D	C	B	E	E	E	D	C	C
d_A, Approach Delay [s/veh]	44.72			37.19			55.68			32.75		
Approach LOS	D			D			E			C		
d_I, Intersection Delay [s/veh]	45.08											
Intersection LOS	D											
Intersection V/C	0.515											

Emissions

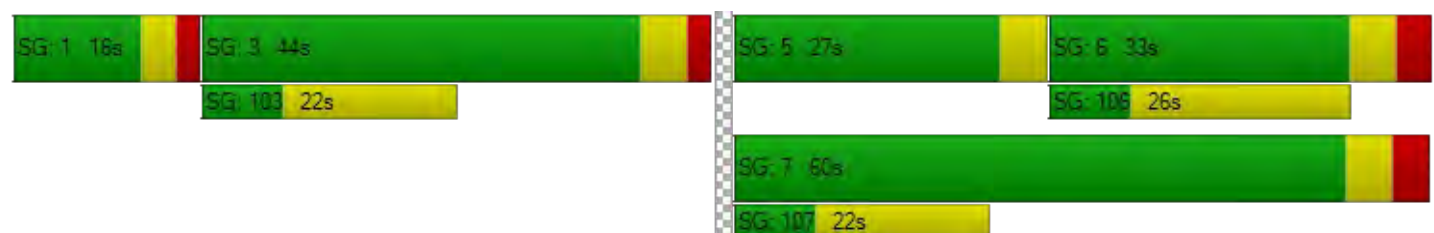
Vehicle Kilometers Traveled [km/h]	51.28	40.65	38.26	3.59	12.66	156.41	3.80	106.89	15.81
Stops [stops/h]	122.10	159.88	88.48	7.53	36.69	449.98	5.64	118.78	16.14
Fuel consumption [L/h]	12.58	14.45	8.29	0.73	3.62	44.58	0.72	17.09	2.42
CO [g/h]	232.28	266.81	153.16	13.47	66.76	823.12	13.30	315.62	44.71
NOx [g/h]	45.19	51.91	29.80	2.62	12.99	160.15	2.59	61.41	8.70
VOC [g/h]	53.83	61.83	35.50	3.12	15.47	190.77	3.08	73.15	10.36

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]	16.46	15.77	17.16	17.45
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	1.900	2.278	2.185	2.491
Crosswalk LOS	A	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	883	633	633
d_b, Bicycle Delay [s]	36.82	18.70	28.02	28.02
I_b,int, Bicycle LOS Score for Intersection	1.804	2.132	2.376	1.895
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):	75.6
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

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	7	89	434	16	47	793	427	77	316	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]	22	80	2	22	109	4	12	198	107	19	79	16
Total Analysis Volume [veh/h]	88	319	7	89	434	16	47	793	427	77	316	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]	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	29	0	17	49	0	10	32	0	10	32	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	29	29	29	54	49	49	10	32	32	10	32	32
g / C, Green / Cycle	0.24	0.24	0.24	0.45	0.41	0.41	0.08	0.27	0.27	0.08	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.10	0.11	0.11	0.08	0.28	0.01	0.03	0.25	0.32	0.05	0.11	0.12
s, saturation flow rate [veh/h]	846	1550	1531	1173	1550	1357	1476	3204	1318	1476	1683	1540
c, Capacity [veh/h]	60	375	370	527	633	554	123	855	351	123	449	411
d1, Uniform Delay [s]	60.00	38.57	38.60	19.85	29.17	21.24	52.07	42.88	42.78	53.19	36.44	36.67
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]	280.57	3.66	3.76	0.69	5.95	0.10	8.77	17.60	120.08	21.68	2.99	3.54
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	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	1.47	0.44	0.44	0.17	0.69	0.03	0.38	0.93	1.22	0.63	0.43	0.45
d, Delay for Lane Group [s/veh]	340.57	42.24	42.36	20.54	35.12	21.34	60.84	60.48	162.86	74.88	39.43	40.22
Lane Group LOS	F	D	D	C	D	C	E	E	F	E	D	D
Critical Lane Group	No	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.50	4.46	4.45	1.56	11.17	0.29	1.64	13.42	21.74	2.99	5.06	4.93
50th-Percentile Queue Length [m/ln]	49.53	34.01	33.92	11.89	85.09	2.18	12.50	102.28	165.69	22.75	38.56	37.56
95th-Percentile Queue Length [veh/ln]	11.70	7.93	7.91	2.81	16.65	0.52	2.95	19.43	32.71	5.37	8.75	8.57
95th-Percentile Queue Length [m/ln]	89.16	60.41	60.28	21.40	126.85	3.93	22.50	148.07	249.26	40.94	66.67	65.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	340.57	42.30	42.36	20.54	35.12	21.34	60.84	60.48	162.86	74.88	39.74	40.22
Movement LOS	F	D	D	C	D	C	E	E	F	E	D	D
d_A, Approach Delay [s/veh]	105.70			32.31			94.99			45.75		
Approach LOS	F			C			F			D		
d_I, Intersection Delay [s/veh]	75.64											
Intersection LOS	E											
Intersection V/C	0.656											

Emissions

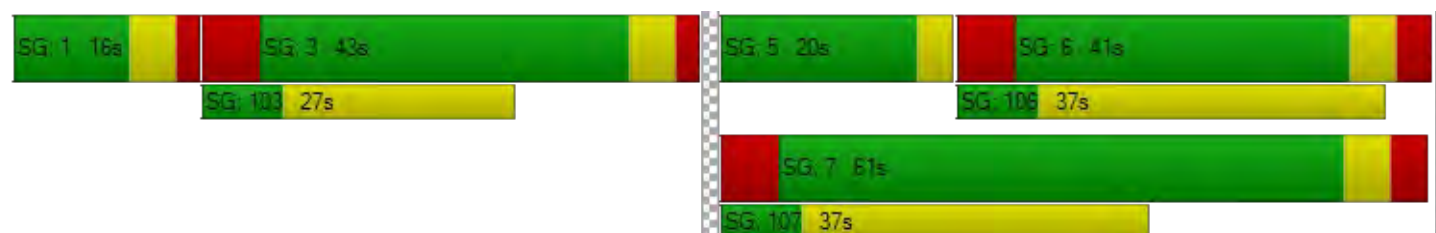
Vehicle Kilometers Traveled [km/h]	42.89	79.65	79.25	19.49	95.03	3.50	29.73	501.57	270.08	37.75	94.58	90.74
Stops [stops/h]	195.01	133.90	133.52	46.80	335.00	8.60	49.22	805.38	652.33	89.55	151.80	147.89
Fuel consumption [L/h]	31.54	15.90	15.84	4.31	28.30	0.79	6.14	102.73	93.89	10.04	18.26	17.68
CO [g/h]	582.35	293.57	292.50	79.63	522.56	14.57	113.29	1896.93	1733.70	185.42	337.26	326.56
NOx [g/h]	113.31	57.12	56.91	15.49	101.67	2.84	22.04	369.07	337.31	36.08	65.62	63.54
VOC [g/h]	134.97	68.04	67.79	18.46	121.11	3.38	26.26	439.63	401.80	42.97	78.16	75.68

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			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	2.12			15.23			16.74			17.92		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.597			2.513			2.944			2.628		
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]	483			817			533			533		
d_b, Bicycle Delay [s]	34.50			21.00			32.27			32.27		
I_b,int, Bicycle LOS Score for Intersection	1.902			2.452			2.640			1.940		
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):	43.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.502

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	140	75	142	6	12	907	32	56	426	27
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	35	19	36	2	3	227	8	14	107	7
Total Analysis Volume [veh/h]	58	105	140	75	142	6	12	907	32	56	426	27
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	43	0	0	43	0	10	40	0	10	40	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	43	43	43	43	10	40	40	10	40	40
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.08	0.33	0.33	0.08	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.05	0.18	0.08	0.10	0.01	0.28	0.28	0.04	0.14	0.14
s, saturation flow rate [veh/h]	1072	1357	994	1535	1476	1683	1647	1476	1683	1622
c, Capacity [veh/h]	353	486	259	550	123	561	549	123	561	541
d1, Uniform Delay [s]	33.51	30.15	41.51	27.34	50.83	37.07	37.21	52.40	30.85	30.95
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]	1.00	3.70	2.81	1.20	1.58	14.24	15.15	11.67	2.18	2.35
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	0.16	0.50	0.29	0.27	0.10	0.84	0.85	0.46	0.41	0.42
d, Delay for Lane Group [s/veh]	34.51	33.85	44.32	28.54	52.41	51.31	52.36	64.07	33.04	33.30
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]	1.42	6.10	2.15	3.25	0.39	14.88	14.87	2.01	5.44	5.38
50th-Percentile Queue Length [m/ln]	10.83	46.50	16.38	24.78	2.96	113.42	113.32	15.29	41.43	41.02
95th-Percentile Queue Length [veh/ln]	2.56	10.15	3.87	5.85	0.70	21.21	21.20	3.61	9.26	9.19
95th-Percentile Queue Length [m/ln]	19.49	77.37	29.48	44.61	5.32	161.63	161.51	27.52	70.56	70.01

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.51	33.85	33.85	44.32	28.54	28.54	52.41	51.81	52.36	64.07	33.16	33.30
Movement LOS	C	C	C	D	C	C	D	D	D	E	C	C
d_A, Approach Delay [s/veh]	33.98			33.85			51.84			36.57		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	43.18											
Intersection LOS	D											
Intersection V/C	0.502											

Emissions

Vehicle Kilometers Traveled [km/h]	16.45	69.50	7.19	14.19	5.88	231.57	228.80	5.91	24.11	23.72
Stops [stops/h]	42.63	183.07	64.49	97.58	11.64	446.53	446.13	60.20	163.09	161.49
Fuel consumption [L/h]	3.90	16.39	4.25	6.16	1.31	50.72	50.60	4.68	11.76	11.64
CO [g/h]	71.99	302.59	78.46	113.74	24.10	936.51	934.31	86.36	217.21	214.98
NOx [g/h]	14.01	58.87	15.26	22.13	4.69	182.21	181.78	16.80	42.26	41.83
VOC [g/h]	16.68	70.13	18.18	26.36	5.59	217.05	216.54	20.01	50.34	49.82

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]	13.89			14.00			17.20			13.97		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.122			2.055			2.692			2.757		
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]	717			717			667			667		
d_b, Bicycle Delay [s]	24.70			24.70			26.67			26.67		
I_b,int, Bicycle LOS Score for Intersection	2.083			1.929			2.347			1.982		
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):	20.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

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	27	90	0	0	0	0	0	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	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	7	23	0	0	0	0	0	4
Total Analysis Volume [veh/h]	117	0	0	0	62	0	27	90	0	0	0	0	0	16
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	0.06	0.12
s, saturation flow rate [veh/h]	1273	1573	911
c, Capacity [veh/h]	242	432	315
d1, Uniform Delay [s]	42.08	28.45	34.52
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	6.79	1.08	2.86
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	0.21	0.34
d, Delay for Lane Group [s/veh]	48.88	29.53	37.39
Lane Group LOS	D	C	D
Critical Lane Group	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.24	1.79	2.51
50th-Percentile Queue Length [m/ln]	24.68	13.65	19.13
95th-Percentile Queue Length [veh/ln]	5.83	3.23	4.52
95th-Percentile Queue Length [m/ln]	44.42	24.58	34.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.88	0.00	0.00	0.00	29.53	0.00	29.53	37.39	0.00	0.00	0.00	0.00	0.00	37.39
Movement LOS	D				C		C	D						D
d_A, Approach Delay [s/veh]	40.52							37.39						
Approach LOS	D							D						
d_I, Intersection Delay [s/veh]	19.99													
Intersection LOS	B													
Intersection V/C	0.578													

Emissions

Vehicle Kilometers Traveled [km/h]	14.35	10.91	24.99
Stops [stops/h]	114.29	63.24	88.60
Fuel consumption [L/h]	8.33	4.48	7.42
CO [g/h]	153.88	82.76	136.97
NOx [g/h]	29.94	16.10	26.65
VOC [g/h]	35.66	19.18	31.74

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m ² /ped]	656.67	1315.55
M_CW, Crosswalk Circulation Area [m ² /ped]	60.79	102.61
d_p, Pedestrian Delay [s]	37.96	37.96
I_p,int, Pedestrian LOS Score for Intersectio	1.828	1.837
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	1.904	1.738
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	44
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	11
Total Analysis Volume [veh/h]	3	0	0	1468	0	0	0	0	0	0	539	0	0	44
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	1626
c, Capacity [veh/h]	1049	923	1015	988
d1, Uniform Delay [s]	14.56	14.56	9.50	9.56
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]	4.56	5.83	0.71	0.76
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	10.22	10.32
Lane Group LOS	B	C	B	B
Critical Lane Group	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	13.01	12.14	3.09	3.11
50th-Percentile Queue Length [m/ln]	99.17	92.52	23.54	23.72
95th-Percentile Queue Length [veh/ln]	18.93	17.86	5.56	5.60
95th-Percentile Queue Length [m/ln]	144.26	136.07	42.37	42.70

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	10.26	0.00	0.00	10.32
Movement LOS	B			B							B			B
d_A, Approach Delay [s/veh]	19.72							10.27						
Approach LOS	B							B						
d_I, Intersection Delay [s/veh]	19.99													
Intersection LOS	B													
Intersection V/C	0.578													

Emissions

Vehicle Kilometers Traveled [km/h]	277.05	252.26	160.95	160.95
Stops [stops/h]	459.35	428.55	109.04	109.88
Fuel consumption [L/h]	48.00	44.63	20.05	20.10
CO [g/h]	886.36	824.10	370.31	371.08
NOx [g/h]	172.45	160.34	72.05	72.20
VOC [g/h]	205.42	190.99	85.82	86.00

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]	679.49	34.95
d_p, Pedestrian Delay [s]	37.96	37.96
I_p,int, Pedestrian LOS Score for Intersectio	2.842	2.817
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	2.044
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

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]	19.99													
Intersection LOS	B													
Intersection V/C	0.578													

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]	19.99													
Intersection LOS	B													
Intersection V/C	0.578													

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):	59.4
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.900

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	68	222	556	39	37	1518	291	25	560	19
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	17	56	139	10	9	380	73	6	140	5
Total Analysis Volume [veh/h]	149	320	68	222	556	39	37	1518	291	25	560	19
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	0.24	0.21	0.18	0.18	0.05	0.54	0.57	0.11	0.17	0.17
s, saturation flow rate [veh/h]	922	1626	1037	1683	1633	745	1683	1585	233	1683	1656
c, Capacity [veh/h]	341	488	323	505	490	351	841	793	72	841	828
d1, Uniform Delay [s]	20.02	32.18	27.16	29.83	29.88	20.57	25.00	25.00	50.00	15.11	15.13
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]	4.05	12.62	11.40	5.11	5.36	0.60	55.21	75.97	12.73	1.13	1.15
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	0.80	0.69	0.60	0.60	0.11	1.08	1.13	0.35	0.35	0.35
d, Delay for Lane Group [s/veh]	24.07	44.80	38.56	34.95	35.24	21.17	80.21	100.97	62.73	16.24	16.29
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]	2.55	10.12	4.56	6.77	6.65	0.62	31.35	34.09	0.88	4.12	4.09
50th-Percentile Queue Length [m/ln]	19.41	77.15	34.75	51.56	50.70	4.73	238.85	259.79	6.67	31.37	31.14
95th-Percentile Queue Length [veh/ln]	4.59	15.34	8.06	11.03	10.88	1.12	43.04	48.00	1.58	7.41	7.36
95th-Percentile Queue Length [m/ln]	34.94	116.92	61.44	84.06	82.93	8.52	327.98	365.78	12.01	56.47	56.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.07	44.80	44.80	38.56	35.08	35.24	21.17	88.53	100.97	62.73	16.26	16.29
Movement LOS	C	D	D	D	D	D	C	F	F	E	B	B
d_A, Approach Delay [s/veh]	39.05			36.04			89.14			18.19		
Approach LOS	D			D			F			B		
d_I, Intersection Delay [s/veh]	59.40											
Intersection LOS	E											
Intersection V/C	0.900											

Emissions

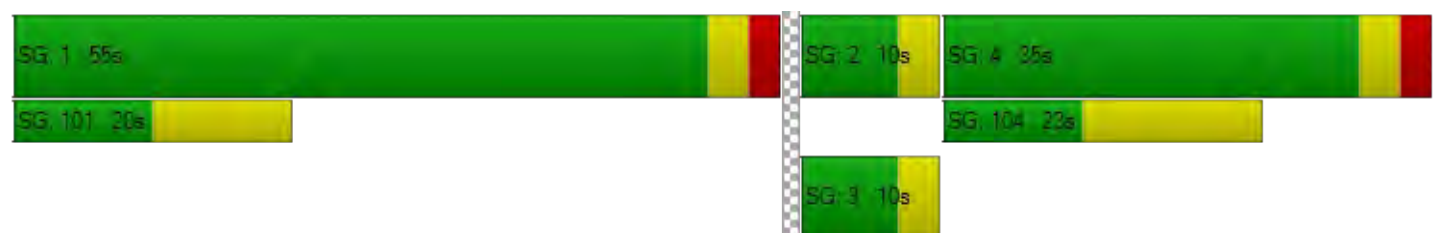
Vehicle Kilometers Traveled [km/h]	34.93	90.96	22.44	30.41	29.73	2.85	70.08	69.31	4.09	47.58	47.11
Stops [stops/h]	91.71	364.50	164.18	243.58	239.53	22.35	1128.43	1227.36	31.53	148.21	147.10
Fuel consumption [L/h]	8.14	30.22	12.41	16.46	16.19	1.38	88.17	104.08	2.30	11.49	11.40
CO [g/h]	150.37	558.04	229.19	303.86	298.90	25.41	1628.16	1921.89	42.55	212.19	210.44
NOx [g/h]	29.26	108.57	44.59	59.12	58.15	4.94	316.78	373.93	8.28	41.28	40.94
VOC [g/h]	34.85	129.33	53.12	70.42	69.27	5.89	377.34	445.42	9.86	49.18	48.77

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]	39.70	29.26	37.33	75.55
d_p, Pedestrian Delay [s]	36.98	36.98	36.98	36.98
I_p,int, Pedestrian LOS Score for Intersectio	2.543	2.494	2.937	2.895
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	2.457	2.237	3.106	2.060
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 Street

Control Type:	Signalized	Delay (sec / veh):	36.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.864

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	8	275	7	551	455	818	13	4	635	83
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	138	114	205	3	1	159	21
Total Analysis Volume [veh/h]	7	3	8	275	7	551	455	818	13	4	635	83
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	30	0	30	30	35	35	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
C, Calculated Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	0.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	25	25	62	65	65	30	30
g / C, Green / Cycle	0.25	0.25	0.62	0.65	0.65	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.05	0.28	0.35	0.70	0.51	0.23	0.23
s, saturation flow rate [veh/h]	359	993	1578	865	1339	1521	1604
c, Capacity [veh/h]	140	319	978	599	870	493	481
d1, Uniform Delay [s]	30.21	40.41	11.05	18.84	12.48	30.28	31.97
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]	1.89	27.78	2.35	39.10	6.98	8.22	11.77
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	0.13	0.88	0.56	1.01	0.78	0.71	0.78
d, Delay for Lane Group [s/veh]	32.11	68.20	13.40	57.95	19.45	38.50	43.74
Lane Group LOS	C	E	B	F	B	D	D
Critical Lane Group	No	Yes	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	0.40	9.47	7.07	13.53	11.11	8.17	9.64
50th-Percentile Queue Length [m/ln]	3.04	72.18	53.85	103.08	84.67	62.26	73.48
95th-Percentile Queue Length [veh/ln]	0.72	14.52	11.43	19.71	16.58	12.86	14.74
95th-Percentile Queue Length [m/ln]	5.48	110.64	87.07	150.16	126.33	97.98	112.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.11	32.11	32.11	68.20	68.20	13.40	57.95	26.49	19.45	38.50	40.91	43.74
Movement LOS	C	C	C	E	E	B	E	C	B	D	D	D
d_A, Approach Delay [s/veh]	32.11			31.95			37.55			41.22		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	36.81											
Intersection LOS	D											
Intersection V/C	0.864											

Emissions

Vehicle Kilometers Traveled [km/h]	0.87	66.11	129.17	95.24	107.36	54.21	58.45
Stops [stops/h]	14.37	340.99	254.41	487.01	400.02	294.15	347.15
Fuel consumption [L/h]	0.85	28.75	23.69	46.97	29.40	22.06	25.97
CO [g/h]	15.70	530.93	437.37	867.30	542.90	407.35	479.52
NOx [g/h]	3.06	103.30	85.10	168.75	105.63	79.26	93.30
VOC [g/h]	3.64	123.05	101.36	201.01	125.82	94.41	111.13

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]	43.81	12.30	0.00	17.29
d_p, Pedestrian Delay [s]	36.98	36.98	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	1.746	2.849	2.787	3.001
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]	500	500	1300	600
d_b, Bicycle Delay [s]	28.13	28.13	6.13	24.50
I_b,int, Bicycle LOS Score for Intersection	1.591	3.025	2.621	2.162
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):	108.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.959

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	1	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	11
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	11
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	48	0	9	57	0	20	43	0	20	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	C	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]	41	41	41	50	50	50	15	36	36	15	36	36
g / C, Green / Cycle	0.34	0.34	0.34	0.42	0.42	0.42	0.13	0.30	0.30	0.13	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.44	0.38	0.40	0.08	0.13	0.13	0.04	0.17	0.17	0.15	0.36	0.01
s, saturation flow rate [veh/h]	1197	1567	2813	392	1722	1673	1640	1870	1854	3459	1870	1405
c, Capacity [veh/h]	445	536	961	186	718	697	205	561	556	432	561	422
d1, Uniform Delay [s]	43.55	39.50	39.50	28.41	23.50	23.54	47.83	35.37	35.38	52.50	42.00	29.62
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]	105.99	74.16	82.41	1.92	1.15	1.20	4.02	4.04	4.10	105.13	101.17	0.11
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	1.19	1.11	1.16	0.17	0.31	0.32	0.32	0.56	0.56	1.19	1.19	0.03
d, Delay for Lane Group [s/veh]	149.54	113.66	121.91	30.33	24.65	24.75	51.85	39.41	39.48	157.63	143.17	29.74
Lane Group LOS	F	F	F	C	C	C	D	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]	26.57	26.50	24.88	0.62	4.52	4.46	2.00	8.37	8.33	12.79	32.12	0.24
50th-Percentile Queue Length [m/ln]	202.44	201.91	189.60	4.73	34.45	34.01	15.28	63.79	63.48	97.48	244.72	1.82
95th-Percentile Queue Length [veh/ln]	39.00	37.51	36.24	1.12	8.01	7.93	3.61	13.12	13.06	20.01	45.96	0.43
95th-Percentile Queue Length [m/ln]	297.20	285.79	276.13	8.52	61.02	60.41	27.50	99.95	99.55	152.51	350.24	3.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	149.54	128.61	121.91	30.33	24.69	24.75	51.85	39.44	39.48	157.63	143.17	29.74
Movement LOS	F	F	F	C	C	C	D	D	D	F	F	C
d_A, Approach Delay [s/veh]	126.24			25.06			40.61			148.35		
Approach LOS	F			C			D			F		
d_I, Intersection Delay [s/veh]	108.51											
Intersection LOS	F											
Intersection V/C	0.959											

Emissions

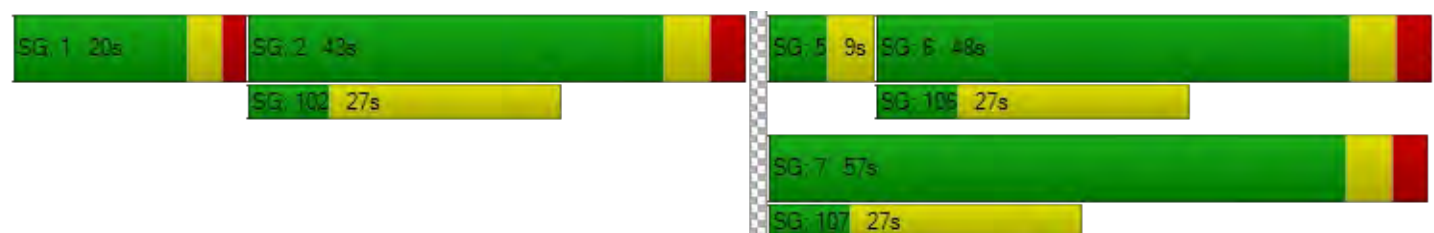
Vehicle Kilometers Traveled [km/h]	163.70	184.56	343.94	12.08	87.99	86.56	10.03	48.70	48.40	120.86	156.90	2.59
Stops [stops/h]	797.00	794.90	1492.89	18.63	135.61	133.90	60.14	251.14	249.93	767.59	963.47	7.18
Fuel consumption [L/h]	94.41	87.63	170.62	2.29	15.70	15.48	4.90	19.84	19.75	91.00	109.98	0.66
CO [g/h]	1743.36	1618.15	3150.61	42.32	289.94	285.76	90.48	366.41	364.61	1680.30	2030.86	12.18
NOx [g/h]	339.20	314.83	612.99	8.23	56.41	55.60	17.60	71.29	70.94	326.92	395.13	2.37
VOC [g/h]	404.04	375.02	730.18	9.81	67.20	66.23	20.97	84.92	84.50	389.43	470.67	2.82

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]	30.88			31.21			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			2.737			2.670			3.068		
Crosswalk LOS	C			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]	683			833			600			600		
d_b, Bicycle Delay [s]	26.00			20.42			29.40			29.40		
I_b,int, Bicycle LOS Score for Intersection	3.508			1.957			2.133			3.525		
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	15.00	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	111	11	644	65	100	472	46	57	500	264
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	28	3	161	16	25	118	12	14	125	66
Total Analysis Volume [veh/h]	45	827	111	11	644	65	100	472	46	57	500	264
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	0.07	0.01	0.20	0.04	0.06	0.25	0.03	0.02	0.27	0.17
s, saturation flow rate [veh/h]	734	3279	1589	781	3279	1552	1640	1870	1589	3186	1870	1589
c, Capacity [veh/h]	189	1093	530	285	1394	660	150	577	490	292	577	490
d1, Uniform Delay [s]	43.38	35.66	28.67	23.06	24.69	20.68	52.72	38.40	29.56	50.41	39.18	34.42
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]	2.94	4.90	0.90	0.25	1.10	0.30	20.88	12.25	0.38	1.49	16.07	4.20
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	0.24	0.76	0.21	0.04	0.46	0.10	0.67	0.82	0.09	0.20	0.87	0.54
d, Delay for Lane Group [s/veh]	46.32	40.56	29.57	23.31	25.79	20.98	73.60	50.65	29.94	51.90	55.25	38.62
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	2.40	0.20	6.61	1.14	3.78	14.67	1.00	0.85	16.31	6.94
50th-Percentile Queue Length [m/ln]	10.04	85.76	18.29	1.50	50.34	8.65	28.83	111.76	7.66	6.51	124.26	52.90
95th-Percentile Queue Length [veh/ln]	2.37	16.76	4.32	0.35	10.82	2.04	6.81	20.95	1.81	1.54	22.93	11.26
95th-Percentile Queue Length [m/ln]	18.06	127.68	32.92	2.70	82.45	15.58	51.90	159.62	13.78	11.71	174.72	85.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.32	40.56	29.57	23.31	25.79	20.98	73.60	50.65	29.94	51.90	55.25	38.62
Movement LOS	D	D	C	C	C	C	E	D	C	D	E	D
d_A, Approach Delay [s/veh]	39.58			25.32			52.82			49.67		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	41.55											
Intersection LOS	D											
Intersection V/C	0.585											

Emissions

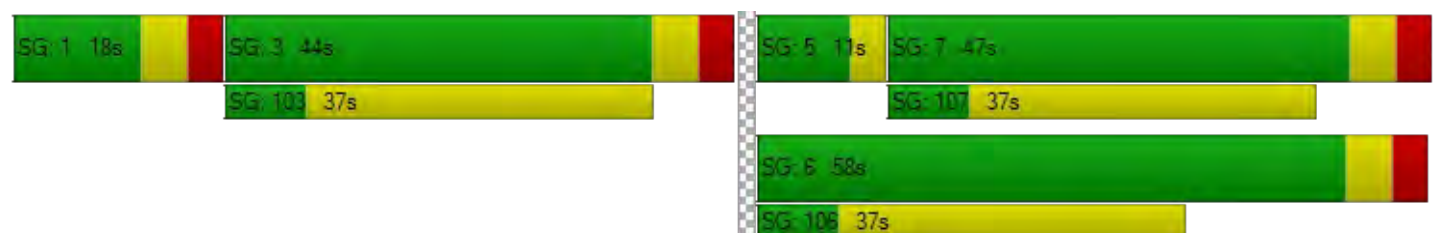
Vehicle Kilometers Traveled [km/h]	11.30	207.72	27.88	2.30	134.50	13.58	23.80	112.35	10.95	20.54	180.17	95.13
Stops [stops/h]	39.51	675.24	72.01	5.90	396.34	34.07	113.52	440.01	30.15	51.24	489.20	208.28
Fuel consumption [L/h]	3.86	65.71	7.28	0.59	37.29	3.33	10.48	38.97	2.78	5.38	49.39	21.58
CO [g/h]	71.37	1213.45	134.41	10.86	688.67	61.53	193.52	719.67	51.32	99.38	912.06	398.45
NOx [g/h]	13.89	236.09	26.15	2.11	133.99	11.97	37.65	140.02	9.98	19.34	177.45	77.52
VOC [g/h]	16.54	281.23	31.15	2.52	159.61	14.26	44.85	166.79	11.89	23.03	211.38	92.34

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			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	57.54			32.22			53.57			54.01		
d_p, Pedestrian Delay [s]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersectio	2.833			2.869			2.514			2.648		
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	2.380			2.159			2.588			2.957		
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):	55.3
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.725

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	192	271	278	36	0	636	100
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	48	68	70	9	0	159	25
Total Analysis Volume [veh/h]	0	265	78	0	86	192	271	278	36	0	636	100
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	Protecte	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	42	0	0	42	0	24	78	0	0	54	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	4.00	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	2.00	4.00	4.00
g_i, Effective Green Time [s]	37	37	37	37	20	72	48
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.17	0.60	0.40
(v / s)_i Volume / Saturation Flow Rate	0.15	0.05	0.05	0.13	0.17	0.17	0.41
s, saturation flow rate [veh/h]	1722	1589	1722	1486	1640	1825	1811
c, Capacity [veh/h]	531	490	531	458	273	1095	725
d1, Uniform Delay [s]	33.92	30.19	30.21	32.65	49.91	11.60	36.00
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]	3.33	0.69	0.65	2.80	52.26	0.66	37.45
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	0.50	0.16	0.16	0.42	0.99	0.29	1.02
d, Delay for Lane Group [s/veh]	37.25	30.88	30.87	35.45	102.18	12.26	73.45
Lane Group LOS	D	C	C	D	F	B	F
Critical Lane Group	Yes	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	6.79	1.75	1.92	4.75	12.03	4.15	28.15
50th-Percentile Queue Length [m/ln]	51.76	13.30	14.61	36.20	91.70	31.59	214.48
95th-Percentile Queue Length [veh/ln]	11.07	3.14	3.45	8.33	17.72	7.46	37.29
95th-Percentile Queue Length [m/ln]	84.33	23.94	26.31	63.44	135.06	56.86	284.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	37.25	30.88	0.00	30.87	35.45	102.18	12.26	12.26	0.00	73.45	73.45
Movement LOS		D	C		C	D	F	B	B		E	E
d_A, Approach Delay [s/veh]	35.80			34.03			53.91			73.45		
Approach LOS	D			C			D			E		
d_I, Intersection Delay [s/veh]	55.27											
Intersection LOS	E											
Intersection V/C	0.725											

Emissions

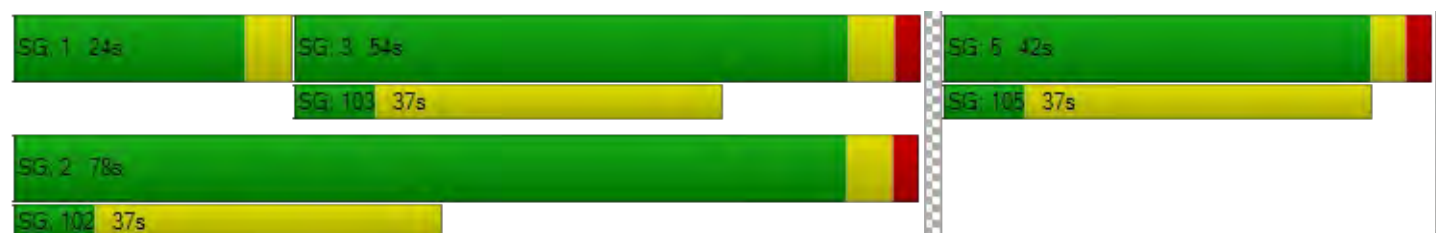
Vehicle Kilometers Traveled [km/h]	54.29	15.98	10.93	24.41	28.33	32.82	426.21
Stops [stops/h]	203.79	52.35	57.54	142.53	361.03	124.36	844.41
Fuel consumption [L/h]	17.34	4.55	4.38	10.76	32.12	8.88	101.13
CO [g/h]	320.19	84.02	80.80	198.73	593.13	163.92	1867.49
NOx [g/h]	62.30	16.35	15.72	38.67	115.40	31.89	363.35
VOC [g/h]	74.21	19.47	18.73	46.06	137.46	37.99	432.81

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	17.45	17.85	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	2.298	2.443	2.304
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]	617	617	1200	800
d_b, Bicycle Delay [s]	28.70	28.70	9.60	21.60
I_b,int, Bicycle LOS Score for Intersection	2.140	2.050	2.531	2.791
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):	0.187

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			Yes			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	51	5	2	21	18	334	17	21	398	8
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	13	1	1	5	5	84	4	5	100	2
Total Analysis Volume [veh/h]	32	14	51	5	2	21	18	334	17	21	398	8
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	0.13	0.12
s, saturation flow rate [veh/h]	1570	1587	1651	1537	1772	1662
c, Capacity [veh/h]	629	627	848	733	906	793
d1, Uniform Delay [s]	14.39	13.80	10.01	10.05	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]	0.52	0.13	0.62	0.78	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	0.25	0.26
d, Delay for Lane Group [s/veh]	14.91	13.94	10.63	10.82	10.76	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]	0.99	0.27	1.56	1.46	1.81	1.70
50th-Percentile Queue Length [m/ln]	7.54	2.07	11.87	11.10	13.76	12.93
95th-Percentile Queue Length [veh/ln]	1.78	0.49	2.80	2.62	3.25	3.05
95th-Percentile Queue Length [m/ln]	13.57	3.73	21.36	19.99	24.77	23.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.91	14.91	14.91	13.94	13.94	13.94	10.63	10.72	10.82	10.76	10.84	10.93
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	14.91			13.94			10.73			10.84		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	11.32											
Intersection LOS	B											
Intersection V/C	0.187											

Emissions

Vehicle Kilometers Traveled [km/h]	8.98	3.00	95.02	87.19	29.07	26.85
Stops [stops/h]	54.80	15.07	86.26	80.71	100.01	93.99
Fuel consumption [L/h]	3.20	0.92	12.55	11.58	6.85	6.39
CO [g/h]	59.04	17.07	231.79	213.82	126.48	118.00
NOx [g/h]	11.49	3.32	45.10	41.60	24.61	22.96
VOC [g/h]	13.68	3.96	53.72	49.55	29.31	27.35

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	13.0	13.0
M_corner, Corner Circulation Area [m²/ped]	54.50	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	126.35	132.46	0.00	235.78
d_p, Pedestrian Delay [s]	24.12	24.12	20.80	20.80
I_p,int, Pedestrian LOS Score for Intersectio	1.810	1.764	2.366	2.326
Crosswalk LOS	A	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]	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	1.728	1.609	1.866	1.913
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):

72.9

Analysis Method:

HCM 7th Edition

Level Of Service:

E

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	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	242	18	114	258	15	98	6	72	991	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
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	61	5	29	65	4	25	2	18	248	6
Total Analysis Volume [veh/h]	732	610	242	18	114	258	15	98	6	72	991	23
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	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	2	3	0	2	3	0	4	1	0	4	1	0
Auxiliary Signal Groups												
Maximum Green [s]	23	43	0	23	43	0	23	22	0	23	22	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	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	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	2.0	0.0	1.0	2.0	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	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]	11	67	0	11	67	0	10	42	0	10	42	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	24	0	7	24	0	7	26	0	7	26	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	Yes		No	Yes	
Maximum Recall	Yes	Yes		Yes	Yes		No	No		No	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	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	3.00	4.00	4.00	3.00	5.00	5.00	3.00	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	2.00	1.00	2.00	2.00	1.00	3.00	3.00	1.00	3.00	3.00
g_i, Effective Green Time [s]	74	63	8	63	63	7	37	37	7	37	37
g / C, Green / Cycle	0.57	0.48	0.06	0.48	0.48	0.05	0.28	0.28	0.05	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.66	0.50	0.01	0.06	0.17	0.01	0.03	0.03	0.04	0.28	0.28
s, saturation flow rate [veh/h]	1104	1702	1667	1825	1556	1781	1750	1712	1709	1840	1823
c, Capacity [veh/h]	677	825	103	884	754	96	498	487	92	524	519
d1, Uniform Delay [s]	36.55	33.50	57.87	18.42	20.68	58.68	34.29	34.30	60.75	45.99	46.01
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.50	0.50	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]	58.86	40.16	3.70	0.30	1.24	0.75	0.42	0.44	13.35	32.98	33.41
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	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	1.08	1.03	0.18	0.13	0.34	0.16	0.10	0.11	0.78	0.97	0.97
d, Delay for Lane Group [s/veh]	95.41	73.66	61.57	18.72	21.91	59.43	34.71	34.74	74.10	78.96	79.42
Lane Group LOS	F	F	E	B	C	E	C	C	E	E	E
Critical Lane Group	Yes	Yes	No	No	No	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	24.84	34.29	0.67	1.98	5.10	0.49	1.29	1.28	2.69	20.91	20.81
50th-Percentile Queue Length [m/ln]	189.25	261.28	5.10	15.09	38.89	3.75	9.82	9.79	20.49	159.34	158.58
95th-Percentile Queue Length [veh/ln]	35.11	45.06	1.20	3.56	8.81	0.89	2.32	2.31	4.84	28.41	28.29
95th-Percentile Queue Length [m/ln]	267.57	343.35	9.17	27.16	67.12	6.75	17.68	17.62	36.89	216.49	215.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	95.41	73.66	73.66	61.57	18.72	21.91	59.43	34.73	34.74	74.10	79.18	79.42
Movement LOS	F	E	E	E	B	C	E	C	C	E	E	E
d_A, Approach Delay [s/veh]	83.71			22.81			37.84			78.85		
Approach LOS	F			C			D			E		
d_I, Intersection Delay [s/veh]	72.86											
Intersection LOS	E											
Intersection V/C	0.904											

Emissions

Vehicle Kilometers Traveled [km/h]	119.73	139.35	2.60	16.47	37.28	3.68	12.78	12.72	6.50	45.94	45.57
Stops [stops/h]	687.76	949.52	18.52	54.84	141.32	13.64	35.69	35.58	74.47	579.08	576.29
Fuel consumption [L/h]	80.61	82.90	1.52	4.44	11.07	1.34	3.41	3.40	6.40	48.32	48.15
CO [g/h]	1488.50	1530.71	28.00	82.01	204.46	24.79	62.97	62.73	118.14	892.21	889.18
NOx [g/h]	289.61	297.82	5.45	15.96	39.78	4.82	12.25	12.20	22.99	173.59	173.00
VOC [g/h]	344.97	354.76	6.49	19.01	47.38	5.75	14.59	14.54	27.38	206.78	206.07

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]	36.75	26.18	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	2.642	2.459	3.580	2.622
Crosswalk LOS	B	B	D	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	969	969	569	569
d_b, Bicycle Delay [s]	17.27	17.27	33.27	33.27
I_b,int, Bicycle LOS Score for Intersection	4.213	2.246	1.659	2.457
Bicycle LOS	D	B	A	B

Sequence

Ring 1	4	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):	47.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.568

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	134	44	203	92	36	342	45	68	293	31
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	34	11	51	23	9	86	11	17	73	8
Total Analysis Volume [veh/h]	227	182	134	44	203	92	36	342	45	68	293	31
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	42	0	12	32	0	7	31	0	7	31	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	26	56	0	12	42	0	8	44	0	8	44	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]	21	46	7	32	47	34	47	34
g / C, Green / Cycle	0.18	0.38	0.06	0.27	0.39	0.28	0.39	0.28
(v / s)_i Volume / Saturation Flow Rate	0.14	0.18	0.03	0.17	0.03	0.23	0.06	0.19
s, saturation flow rate [veh/h]	1640	1714	1640	1744	1192	1671	1147	1680
c, Capacity [veh/h]	287	657	96	465	374	473	321	476
d1, Uniform Delay [s]	47.40	27.97	54.67	38.84	24.52	40.11	26.17	38.18
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]	19.61	2.51	15.08	6.46	0.51	14.48	1.50	7.66
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	0.79	0.48	0.46	0.63	0.10	0.82	0.21	0.68
d, Delay for Lane Group [s/veh]	67.01	30.48	69.75	45.30	25.04	54.59	27.67	45.84
Lane Group LOS	E	C	E	D	C	D	C	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.04	7.29	1.69	8.47	0.69	12.46	1.36	9.43
50th-Percentile Queue Length [m/ln]	61.24	55.52	12.86	64.56	5.27	94.94	10.39	71.82
95th-Percentile Queue Length [veh/ln]	12.69	11.71	3.04	13.25	1.25	18.25	2.46	14.46
95th-Percentile Queue Length [m/ln]	96.67	89.25	23.14	100.94	9.49	139.05	18.71	110.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.01	30.48	30.48	69.75	45.30	45.30	25.04	54.59	54.59	27.67	45.84	45.84
Movement LOS	E	C	C	E	D	D	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	45.75			48.47			52.08			42.69		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	47.16											
Intersection LOS	D											
Intersection V/C	0.568											

Emissions

Vehicle Kilometers Traveled [km/h]	57.37	79.86	14.95	100.24	10.30	110.71	23.38	111.41
Stops [stops/h]	241.10	218.58	50.62	254.18	20.75	373.79	40.92	282.76
Fuel consumption [L/h]	22.58	19.92	4.92	25.53	2.14	35.19	4.59	28.38
CO [g/h]	417.00	367.87	90.88	471.46	39.51	649.83	84.79	524.11
NOx [g/h]	81.13	71.57	17.68	91.73	7.69	126.43	16.50	101.97
VOC [g/h]	96.64	85.26	21.06	109.27	9.16	150.60	19.65	121.47

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]	27.17	28.48	21.79	18.60
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.297	2.184	2.417	2.383
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]	767	533	567	567
d_b, Bicycle Delay [s]	22.82	32.27	30.82	30.82
I_b,int, Bicycle LOS Score for Intersection	2.477	2.134	2.266	2.211
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):	78.9
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.815

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	L	C
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	4.00	6.00	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
l2, Clearance Lost Time [s]	5.00	5.00	2.00	4.00	5.00	5.00	0.00	5.00	0.00	5.00
g_i, Effective Green Time [s]	21	48	62	7	33	33	45	34	45	34
g / C, Green / Cycle	0.18	0.40	0.52	0.06	0.28	0.28	0.38	0.28	0.38	0.28
(v / s)_i Volume / Saturation Flow Rate	0.14	0.11	0.46	0.04	0.07	0.07	0.12	0.38	0.17	0.12
s, saturation flow rate [veh/h]	1640	3560	1494	751	1722	1662	1278	1811	962	1837
c, Capacity [veh/h]	287	1424	772	91	474	457	452	513	236	521
d1, Uniform Delay [s]	47.70	24.14	18.77	57.56	33.81	33.88	26.29	43.00	31.12	35.18
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]	22.60	0.45	15.36	10.28	1.23	1.32	1.95	161.92	15.37	2.67
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	0.82	0.26	0.90	0.35	0.24	0.25	0.33	1.33	0.69	0.44
d, Delay for Lane Group [s/veh]	70.30	24.58	34.13	67.84	35.04	35.20	28.23	204.92	46.49	37.85
Lane Group LOS	E	C	C	E	D	D	C	F	D	D
Critical Lane Group	Yes	No	Yes	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.57	3.66	15.05	1.23	2.80	2.79	3.16	38.09	4.22	5.84
50th-Percentile Queue Length [m/ln]	65.34	27.85	114.67	9.38	21.35	21.27	24.04	290.21	32.15	44.51
95th-Percentile Queue Length [veh/ln]	13.38	6.58	21.41	2.21	5.04	5.02	5.68	56.42	7.59	9.80
95th-Percentile Queue Length [m/ln]	101.93	50.13	163.15	16.88	38.44	38.28	43.27	429.95	57.81	74.71

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	70.30	24.58	34.13	67.84	35.12	35.20	28.23	204.92	204.92	46.49	37.85	37.85
Movement LOS	E	C	C	E	D	D	C	F	F	D	D	D
d_A, Approach Delay [s/veh]	37.94			39.10			173.28			41.45		
Approach LOS	D			D			F			D		
d_I, Intersection Delay [s/veh]	78.92											
Intersection LOS	E											
Intersection V/C	0.815											

Emissions

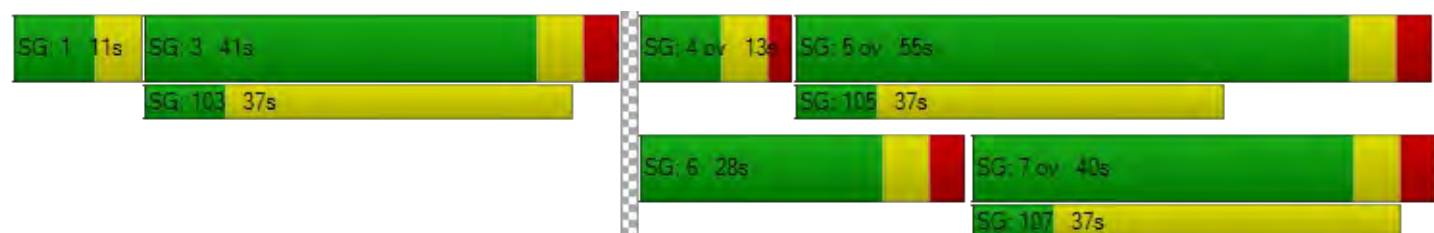
Vehicle Kilometers Traveled [km/h]	42.30	67.03	124.20	7.24	26.25	26.03	57.30	262.67	44.66	62.46
Stops [stops/h]	257.23	219.31	451.45	36.91	84.07	83.73	94.65	1142.57	126.56	175.22
Fuel consumption [L/h]	22.57	18.38	40.16	3.19	7.51	7.47	10.82	158.41	12.92	16.52
CO [g/h]	416.83	339.39	741.65	58.89	138.77	138.00	199.72	2925.22	238.66	305.06
NOx [g/h]	81.10	66.03	144.30	11.46	27.00	26.85	38.86	569.14	46.43	59.35
VOC [g/h]	96.61	78.66	171.88	13.65	32.16	31.98	46.29	677.95	55.31	70.70

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			2.405			2.607		
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			2.947			2.208		
Bicycle LOS	B			A			C			B		

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):
Level Of Service:
Volume to Capacity (v/c):52.9
D
0.865**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	0
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	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			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	112	76	805	58	55	516	78	74	744	239
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	28	19	201	15	14	129	20	19	186	60
Total Analysis Volume [veh/h]	426	1553	112	76	805	58	55	516	78	74	744	239
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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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	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	55	0	10	42	0	9	35	0	9	35	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	26	0	7	5	0	6	23	0	6	23	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]	7
Pedestrian Clearance [s]	33

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]	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]	60	50	50	60	37	37	30	30	30	30	30	30
g / C, Green / Cycle	0.60	0.50	0.50	0.60	0.37	0.37	0.30	0.30	0.30	0.30	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.47	0.49	0.51	0.17	0.26	0.26	0.11	0.18	0.18	0.11	0.32	0.33
s, saturation flow rate [veh/h]	898	1683	1630	446	1683	1629	515	1683	1645	704	1616	1419
c, Capacity [veh/h]	515	844	817	238	625	605	74	503	491	154	483	424
d1, Uniform Delay [s]	17.77	24.61	24.93	21.84	26.69	26.77	49.99	29.86	30.01	43.64	35.07	35.07
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.19	0.21
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]	14.22	27.94	36.22	3.49	6.38	6.76	13.50	1.11	1.20	2.32	43.13	63.41
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	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	0.83	0.99	1.02	0.32	0.70	0.70	0.74	0.59	0.60	0.48	1.06	1.11
d, Delay for Lane Group [s/veh]	32.00	52.55	61.15	25.33	33.07	33.53	63.49	30.98	31.21	45.96	78.20	98.48
Lane Group LOS	C	D	F	C	C	C	E	C	C	D	F	F
Critical Lane Group	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.84	24.57	26.15	0.88	9.69	9.54	1.64	6.12	6.15	1.91	17.35	17.63
50th-Percentile Queue Length [m/ln]	52.12	187.20	199.26	6.72	73.80	72.68	12.53	46.64	46.87	14.54	132.21	134.31
95th-Percentile Queue Length [veh/ln]	11.13	32.70	35.05	1.59	14.79	14.60	2.96	10.18	10.22	3.44	25.10	26.09
95th-Percentile Queue Length [m/ln]	84.81	249.14	267.07	12.10	112.69	111.28	22.56	77.56	77.86	26.18	191.24	198.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.00	56.54	61.15	25.33	33.28	33.53	63.49	31.07	31.21	45.96	84.51	98.48
Movement LOS	C	E	E	C	C	C	E	C	C	D	F	F
d_A, Approach Delay [s/veh]	51.79			32.65			33.84			84.97		
Approach LOS	D			C			C			F		
d_I, Intersection Delay [s/veh]	52.94											
Intersection LOS	D											
Intersection V/C	0.865											

Emissions

Vehicle Kilometers Traveled [km/h]	133.06	260.04	260.04	8.38	48.15	47.02	31.73	171.46	171.26	12.51	86.65	79.57
Stops [stops/h]	246.25	884.43	941.41	31.76	348.66	343.39	59.20	220.36	221.43	68.71	624.60	634.55
Fuel consumption [L/h]	28.68	78.28	85.07	2.99	23.52	23.19	7.04	28.35	28.40	4.93	49.02	53.24
CO [g/h]	529.67	1445.41	1570.91	55.26	434.36	428.20	129.94	523.47	524.37	91.10	905.15	983.09
NOx [g/h]	103.05	281.22	305.64	10.75	84.51	83.31	25.28	101.85	102.02	17.72	176.11	191.27
VOC [g/h]	122.76	334.99	364.07	12.81	100.67	99.24	30.12	121.32	121.53	21.11	209.78	227.84

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	23.53			19.66			0.00			32.41		
M_CW, Crosswalk Circulation Area [m²/ped]	34.02			15.26			20.97			22.62		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	3.045			2.960			2.935			2.685		
Crosswalk LOS	C			C			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	900			640			500			500		
d_b, Bicycle Delay [s]	15.25			23.13			28.17			28.18		
I_b,int, Bicycle LOS Score for Intersection	3.294			2.339			2.102			2.451		
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	2.645	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
I, 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): 25.8
Level Of Service: D
Volume to Capacity (v/c): 0.346

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	Yes			Yes			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	0	0	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	0	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	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	0	23
Total Analysis Volume [veh/h]	0	1776	24	19	927	67	0	0	0	0	0	91
Pedestrian Volume [ped/h]	25			25			26			10		

Intersection Settings												
Priority Scheme	Free			Free			Stop			Stop		
Flared Lane												
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	0.00	0.00	0.35
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	0.00	0.00	25.79
Movement LOS		A	A	C	A	A						D
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	1.49
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	0.24	0.12	0.00	0.00	0.00	0.00	0.00	0.00	11.33
d_A, Approach Delay [s/veh]	0.00			0.30			0.00			25.79		
Approach LOS	A			A			A			D		
d_I, Intersection Delay [s/veh]	0.91											
Intersection LOS	D											

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

Control Type:	Signalized	Delay (sec / veh):	100.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.526

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				Yes				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												
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]	25	31	0	14	0	0	31	0	0	0	14	25
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	24	0	7	0	0	24	0	0	0	7	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	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	23

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]	54	54	68	29	29	9	9	9
g / C, Green / Cycle	0.54	0.54	0.68	0.29	0.29	0.09	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.85	0.37	0.01	0.31	0.32	0.11	0.14	0.10
s, saturation flow rate [veh/h]	805	3204	1446	1683	1615	1210	934	1396
c, Capacity [veh/h]	473	1723	979	484	464	157	156	126
d1, Uniform Delay [s]	33.62	16.85	5.23	35.62	35.62	47.78	47.80	45.39
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]	214.63	2.19	0.02	62.71	79.15	12.08	12.40	84.72
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	1.45	0.68	0.01	1.08	1.12	0.85	0.86	1.15
d, Delay for Lane Group [s/veh]	248.25	19.04	5.25	98.33	114.77	59.85	60.19	130.11
Lane Group LOS	F	B	A	F	F	E	E	F
Critical Lane Group	Yes	No	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	34.81	9.65	0.06	19.86	21.18	3.90	3.91	6.03
50th-Percentile Queue Length [m/ln]	265.27	73.50	0.45	151.36	161.38	29.72	29.81	45.97
95th-Percentile Queue Length [veh/ln]	55.89	14.74	0.11	28.42	30.77	7.02	7.04	10.53
95th-Percentile Queue Length [m/ln]	425.85	112.32	0.81	216.57	234.44	53.50	53.66	80.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	248.25	19.04	0.00	5.25	0.00	0.00	104.50	114.77	60.02	0.00	60.19	130.11
Movement LOS	F	B		A			F	F	E		E	F
d_A, Approach Delay [s/veh]	103.24				106.55				84.58			
Approach LOS	F				F				F			
d_I, Intersection Delay [s/veh]	100.71											
Intersection LOS	F											
Intersection V/C	0.526											

Emissions

Vehicle Kilometers Traveled [km/h]	72.47	123.71	0.95	53.89	53.89	26.35	26.35	28.42
Stops [stops/h]	1253.22	694.53	2.12	715.07	762.43	140.41	140.83	217.19
Fuel consumption [L/h]	166.17	44.52	0.17	60.59	68.24	11.81	11.86	22.01
CO [g/h]	3068.39	822.14	3.22	1118.79	1260.12	218.10	218.92	406.36
NOx [g/h]	597.00	159.96	0.63	217.68	245.17	42.43	42.59	79.06
VOC [g/h]	711.13	190.54	0.75	259.29	292.04	50.55	50.74	94.18

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0				11.0				11.0			
M_corner, Corner Circulation Area [m²/ped]	21.07				213.95				0.00			
M_CW, Crosswalk Circulation Area [m²/ped]	11.36				0.00				20.60			
d_p, Pedestrian Delay [s]	39.61				39.61				39.61			
I_p,int, Pedestrian LOS Score for Intersectio	2.972				2.290				2.600			
Crosswalk LOS	C				B				B			
s_b, Saturation Flow Rate of the bicycle lane	2000				2000				2000			
c_b, Capacity of the bicycle lane [bicycles/h]	1020				520				180			
d_b, Bicycle Delay [s]	12.16				27.46				41.51			
I_b,int, Bicycle LOS Score for Intersection	3.100				2.437				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				Yes			

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								
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]	14	0	0	0	0	0	0	0
Lead / Lag	Lag	-	-	-	-	-	-	-
Minimum Green [s]	7	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	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	23

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]	9	9	
g / C, Green / Cycle	0.09	0.09	
(v / s)_i Volume / Saturation Flow Rate	0.02	0.04	
s, saturation flow rate [veh/h]	1120	1431	
c, Capacity [veh/h]	72	129	
d1, Uniform Delay [s]	50.00	43.15	
k, delay calibration	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	2.06	2.45	
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	0.28	0.45	
d, Delay for Lane Group [s/veh]	52.06	45.61	
Lane Group LOS	D	D	
Critical Lane Group	No	No	
50th-Percentile Queue Length [veh/ln]	0.55	1.47	
50th-Percentile Queue Length [m/ln]	4.19	11.22	
95th-Percentile Queue Length [veh/ln]	0.99	2.65	
95th-Percentile Queue Length [m/ln]	7.54	20.20	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.06	0.00	0.00	45.61	0.00	0.00	0.00	0.00
Movement LOS	D			D				
d_A, Approach Delay [s/veh]	47.26				0.00			
Approach LOS	D				A			
d_I, Intersection Delay [s/veh]	100.71							
Intersection LOS	F							
Intersection V/C	0.526							

Emissions

Vehicle Kilometers Traveled [km/h]	0.73	2.11	
Stops [stops/h]	19.78	53.01	
Fuel consumption [L/h]	1.05	2.72	
CO [g/h]	19.36	50.18	
NOx [g/h]	3.77	9.76	
VOC [g/h]	4.49	11.63	

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]	39.71	0.00
d_p, Pedestrian Delay [s]	39.61	39.61
I_p,int, Pedestrian LOS Score for Intersectio	1.974	2.858
Crosswalk LOS	A	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	180	0
d_b, Bicycle Delay [s]	41.41	50.00
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132
Bicycle LOS	A	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
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):	63.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.859

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	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.00	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					
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	8.0	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	15	15	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	0.60	
s, saturation flow rate [veh/h]		3113	2497	
c, Capacity [veh/h]		840	1404	
d1, Uniform Delay [s]		35.85	21.50	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		21.15	45.47	
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	1.07	
d, Delay for Lane Group [s/veh]		56.99	66.97	
Lane Group LOS		E	F	
Critical Lane Group		Yes	Yes	
50th-Percentile Queue Length [veh/ln]		11.79	23.36	
50th-Percentile Queue Length [m/ln]		89.84	177.99	
95th-Percentile Queue Length [veh/ln]		17.42	33.01	
95th-Percentile Queue Length [m/ln]		132.76	251.53	

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	66.97	66.97	0.00	0.00	0.00
Movement LOS				E	E			F	E			
d_A, Approach Delay [s/veh]	0.00			56.99			66.97			0.00		
Approach LOS	A			E			E			A		
d_I, Intersection Delay [s/veh]	63.51											
Intersection LOS	E											
Intersection V/C	0.859											

Emissions

Vehicle Kilometers Traveled [km/h]		143.51	80.96	
Stops [stops/h]		848.93	1681.78	
Fuel consumption [L/h]		67.77	122.96	
CO [g/h]		1251.46	2270.53	
NOx [g/h]		243.49	441.76	
VOC [g/h]		290.04	526.22	

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	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	2.768	2.428
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]	0	540	940	0
d_b, Bicycle Delay [s]	50.00	26.66	14.08	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	8.0	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	15	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	
I, 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	2.246	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	940	0
d_b, Bicycle Delay [s]	50.00	14.06	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):	0.645

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			Yes			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	40	46	347	566	153	423	18
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	10	12	87	142	38	106	5
Total Analysis Volume [veh/h]	870	546	153	0	294	40	46	347	566	153	423	18
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]	190
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	33	0	0	33	60	15	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	24	0	0	24	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]	70	33	0	0	33	70	46	36	70	51	41	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]	2389	3204	1431	3204	1318	1535	2951	2329	3113	1550	1527
c, Capacity [veh/h]	905	1851	240	539	761	60	696	1503	195	402	396
d1, Uniform Delay [s]	51.88	17.34	62.46	61.41	14.83	76.75	53.34	13.40	74.48	51.57	51.59
k, delay calibration	0.11	0.11	0.11	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]	7.44	0.09	2.78	0.86	0.03	18.65	2.54	0.16	6.81	5.36	5.47
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	0.79	0.55	0.55
d, Delay for Lane Group [s/veh]	59.31	17.42	65.24	62.27	14.86	95.40	55.89	13.55	81.29	56.93	57.06
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]	18.51	5.28	6.06	5.62	0.66	2.21	6.39	4.86	3.32	8.41	8.33
50th-Percentile Queue Length [m/ln]	141.02	40.21	46.19	42.79	5.06	16.84	48.70	37.05	25.33	64.12	63.44
95th-Percentile Queue Length [veh/ln]	25.56	9.04	10.10	9.50	1.20	3.98	10.54	8.48	5.98	13.17	13.06
95th-Percentile Queue Length [m/ln]	194.78	68.92	76.96	72.41	9.12	30.31	80.30	64.61	45.59	100.37	99.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.31	17.42	65.24	0.00	62.27	14.86	95.40	55.89	13.55	81.29	56.99	57.06
Movement LOS	E	B	E		E	B	F	E	B	F	E	E
d_A, Approach Delay [s/veh]	45.31			56.60			32.80			63.25		
Approach LOS	D			E			C			E		
d_I, Intersection Delay [s/veh]	46.01											
Intersection LOS	D											
Intersection V/C	0.645											

Emissions

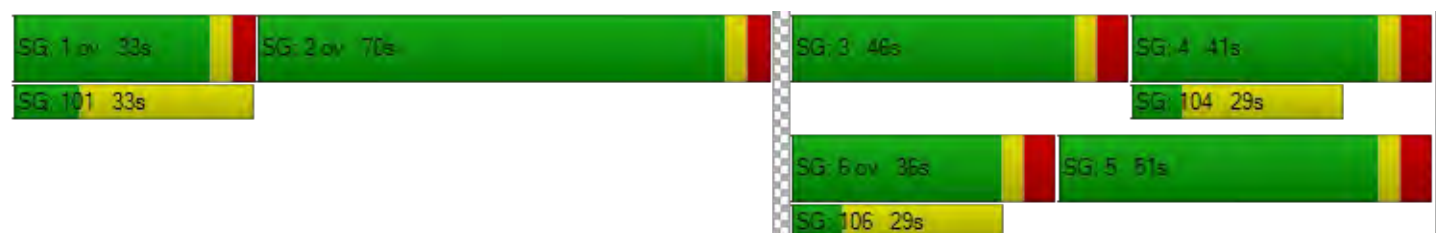
Vehicle Kilometers Traveled [km/h]	246.27	154.55	43.31	67.96	9.25	15.12	114.09	186.10	25.38	36.81	36.36
Stops [stops/h]	827.19	235.86	135.48	251.02	14.85	49.39	285.69	217.33	148.57	188.04	186.07
Fuel consumption [L/h]	81.73	27.32	14.85	26.20	1.67	5.93	32.20	28.49	15.33	17.45	17.26
CO [g/h]	1509.24	504.56	274.17	483.77	30.85	109.45	594.62	526.10	283.01	322.17	318.80
NOx [g/h]	293.64	98.17	53.34	94.12	6.00	21.29	115.69	102.36	55.06	62.68	62.03
VOC [g/h]	349.78	116.94	63.54	112.12	7.15	25.37	137.81	121.93	65.59	74.67	73.88

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			13.0			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			228.90			0.00			21.97		
d_p, Pedestrian Delay [s]	69.92			69.92			68.07			68.07		
I_p,int, Pedestrian LOS Score for Intersectio	2.965			2.525			4.189			2.670		
Crosswalk LOS	C			B			D			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1204			335			360			422		
d_b, Bicycle Delay [s]	12.75			55.81			54.15			50.13		
I_b,int, Bicycle LOS Score for Intersection	2.868			1.838			2.351			2.051		
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):	104.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

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	Protecte	Overlap	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	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	5.0	5.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	27	29	29	0	29	0	10	34	0	10	34	0
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	15	0	7	15	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, Calculated Cycle Length [s]	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	3.00	5.00	5.00	3.00	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
l2, Clearance Lost Time [s]	1.00	0.00	0.00	3.00	3.00	3.00	1.00	3.00	3.00	1.00	3.00
g_i, Effective Green Time [s]	24	51	51	24	24	24	6	30	30	7	29
g / C, Green / Cycle	0.24	0.51	0.51	0.24	0.24	0.24	0.06	0.30	0.30	0.07	0.29
(v / s)_i Volume / Saturation Flow Rate	0.18	0.08	0.10	0.02	0.01	0.02	0.04	0.17	0.22	0.04	0.41
s, saturation flow rate [veh/h]	1667	1683	1321	938	1750	1368	1603	1683	1229	1603	1576
c, Capacity [veh/h]	400	858	674	225	420	328	99	502	367	112	457
d1, Uniform Delay [s]	35.19	13.10	13.35	35.75	29.30	29.41	46.08	29.51	31.59	44.96	35.50
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	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	1.00
d2, Incremental Delay [s]	12.04	0.41	0.66	0.74	0.27	0.45	9.46	4.41	12.67	17.60	204.44
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	0.75	0.16	0.20	0.08	0.06	0.08	0.72	0.56	0.74	0.54	1.43
d, Delay for Lane Group [s/veh]	47.23	13.51	14.00	36.49	29.58	29.86	55.55	33.93	44.27	62.56	239.94
Lane Group LOS	D	B	B	D	C	C	E	C	D	E	F
Critical Lane Group	Yes	No	Yes	No	No	No	No	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	7.96	1.74	1.70	0.44	0.50	0.50	1.98	6.17	7.07	2.00	36.76
50th-Percentile Queue Length [m/ln]	60.66	13.27	12.97	3.35	3.79	3.80	15.08	47.02	53.85	15.25	280.08
95th-Percentile Queue Length [veh/ln]	12.59	3.13	3.06	0.79	0.90	0.90	3.56	10.24	11.43	3.60	56.18
95th-Percentile Queue Length [m/ln]	95.92	23.89	23.34	6.04	6.83	6.84	27.15	78.06	87.08	27.44	428.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.23	13.51	14.00	36.49	29.60	29.86	55.55	33.93	44.27	62.56	239.94	239.94
Movement LOS	D	B	B	D	C	C	E	C	D	E	F	F
d_A, Approach Delay [s/veh]	31.22			31.58			40.90			224.76		
Approach LOS	C			C			D			F		
d_I, Intersection Delay [s/veh]	104.05											
Intersection LOS	F											
Intersection V/C	0.657											

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	300.62
Stops [stops/h]	286.60	62.70	61.27	15.84	17.93	17.95	71.25	222.12	254.43	72.03	1323.21
Fuel consumption [L/h]	30.80	9.24	8.81	1.25	1.46	1.44	6.46	19.48	21.95	7.23	178.77
CO [g/h]	568.66	170.54	162.68	23.07	26.89	26.59	119.21	359.64	405.37	133.53	3301.09
NOx [g/h]	110.64	33.18	31.65	4.49	5.23	5.17	23.19	69.97	78.87	25.98	642.27
VOC [g/h]	131.79	39.52	37.70	5.35	6.23	6.16	27.63	83.35	93.95	30.95	765.06

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			11.0			11.0		
M_corner, Corner Circulation Area [m²/ped]	0.00			106.99			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	5.84			4.72			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	2.524			2.382			2.661			2.471		
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]	1020			380			480			480		
d_b, Bicycle Delay [s]	12.01			32.81			28.88			28.88		
I_b,int, Bicycle LOS Score for Intersection	2.045			1.618			2.098			2.751		
Bicycle LOS	B			A			B			C		

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):	32.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

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	18	219	0	81	112	405	0	0	426	556
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	5	55	0	20	28	101	0	0	107	139
Total Analysis Volume [veh/h]	0	95	18	219	0	81	112	405	0	0	426	556
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	0.06	0.07	0.13	0.25	0.40
s, saturation flow rate [veh/h]	1668	1954	1359	1603	3204	1683	1380
c, Capacity [veh/h]	534	559	435	140	1419	745	611
d1, Uniform Delay [s]	24.80	31.74	24.51	44.80	17.76	20.77	25.98
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]	0.90	2.06	0.94	10.16	0.51	3.17	19.89
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	0.19	0.80	0.29	0.57	0.91
d, Delay for Lane Group [s/veh]	25.70	33.80	25.45	54.97	18.27	23.94	45.87
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]	2.07	2.37	1.48	3.10	3.00	7.80	15.04
50th-Percentile Queue Length [m/ln]	15.76	18.06	11.31	23.59	22.88	59.44	114.60
95th-Percentile Queue Length [veh/ln]	3.72	4.27	2.67	5.57	5.41	12.38	21.40
95th-Percentile Queue Length [m/ln]	28.36	32.51	20.36	42.47	41.19	94.34	163.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	25.70	25.70	33.80	0.00	25.45	54.97	18.27	0.00	0.00	23.94	45.87
Movement LOS		C	C	C		C	D	B			C	D
d_A, Approach Delay [s/veh]	25.70			31.54			26.22			36.36		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	32.23											
Intersection LOS	C											
Intersection V/C	0.585											

Emissions

Vehicle Kilometers Traveled [km/h]	11.14	48.02	17.76	31.99	115.68	245.79	320.80
Stops [stops/h]	74.45	170.63	53.43	111.47	216.23	280.82	541.43
Fuel consumption [L/h]	4.97	14.10	4.48	10.29	21.56	37.54	62.31
CO [g/h]	91.73	260.31	82.66	189.94	398.04	693.25	1150.65
NOx [g/h]	17.85	50.65	16.08	36.95	77.44	134.88	223.88
VOC [g/h]	21.26	60.33	19.16	44.02	92.25	160.67	266.68

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	1.32	26.68	9.39
d_p, Pedestrian Delay [s]	39.61	39.61	38.72	38.72
I_p,int, Pedestrian LOS Score for Intersectio	1.547	2.544	2.512	2.951
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	1.749	1.560	1.986	2.416
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 [m ² /ped]	0.00	123.77
M_CW, Crosswalk Circulation Area [m ² /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

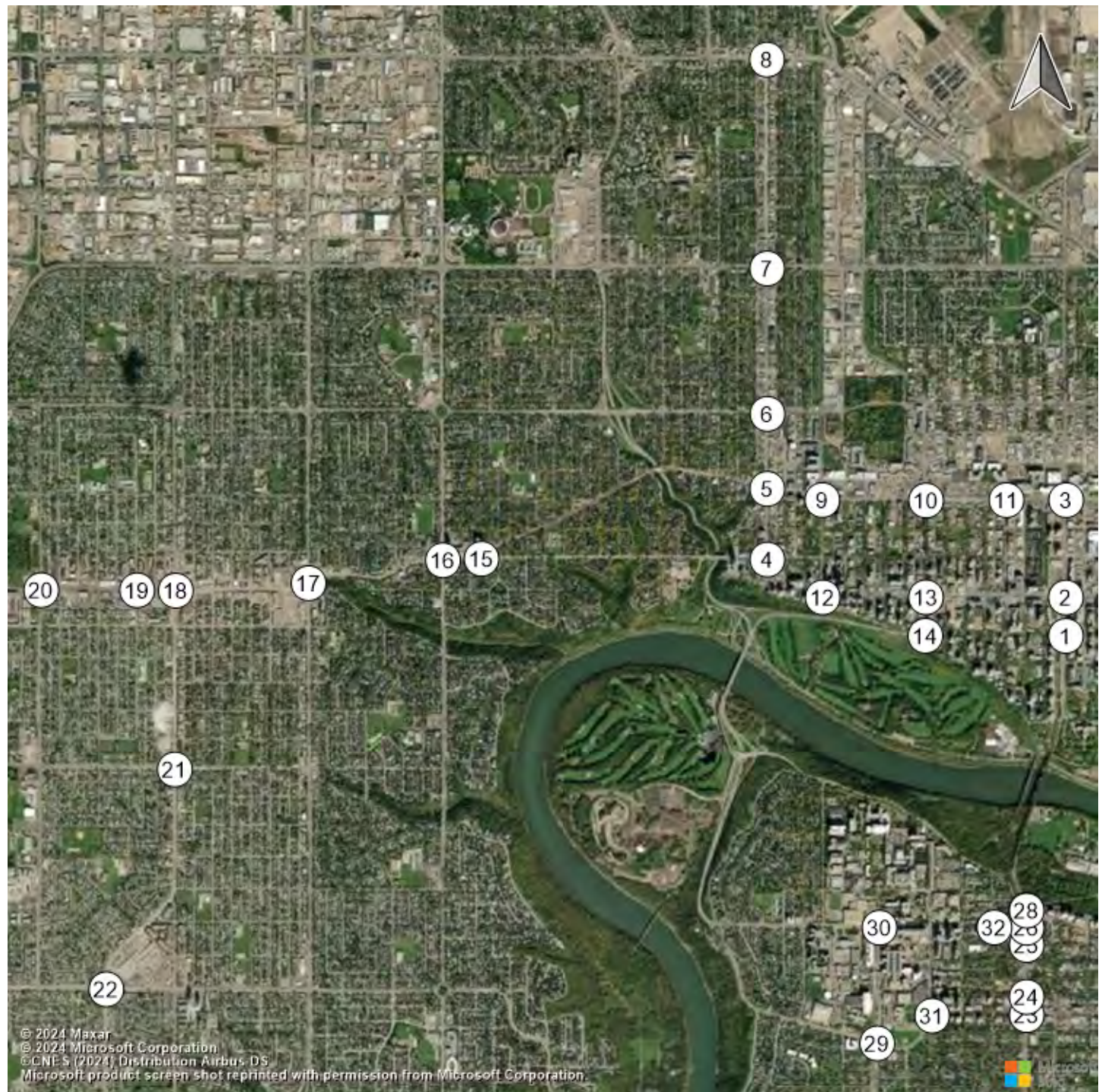
g_Walk,mi, Effective Walk Time [s]	19.0	19.0
M_corner, Corner Circulation Area [m²/ped]	35.51	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	47.11	128.92
d_p, Pedestrian Delay [s]	32.81	32.81
I_p,int, Pedestrian LOS Score for Intersectio	1.749	1.764
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the 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

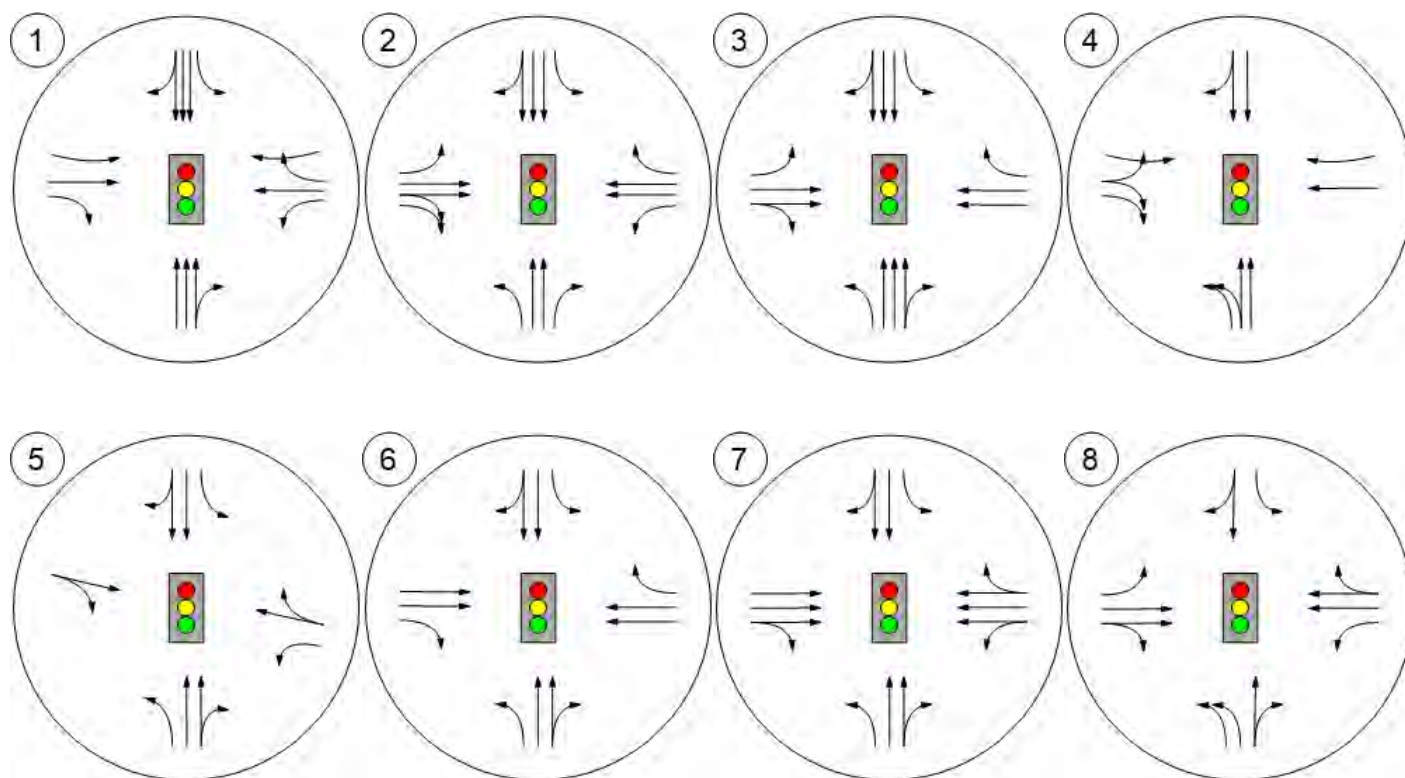
Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



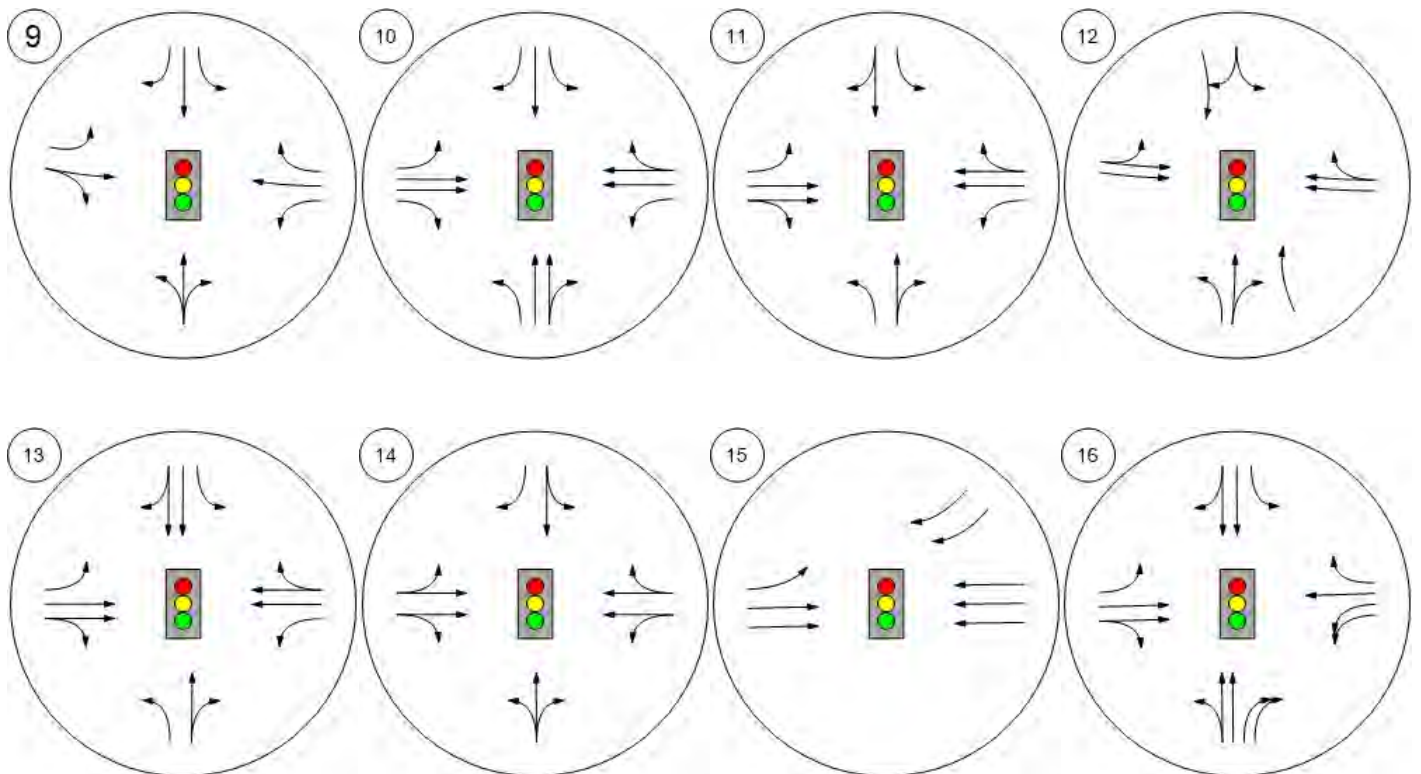
Study Intersections



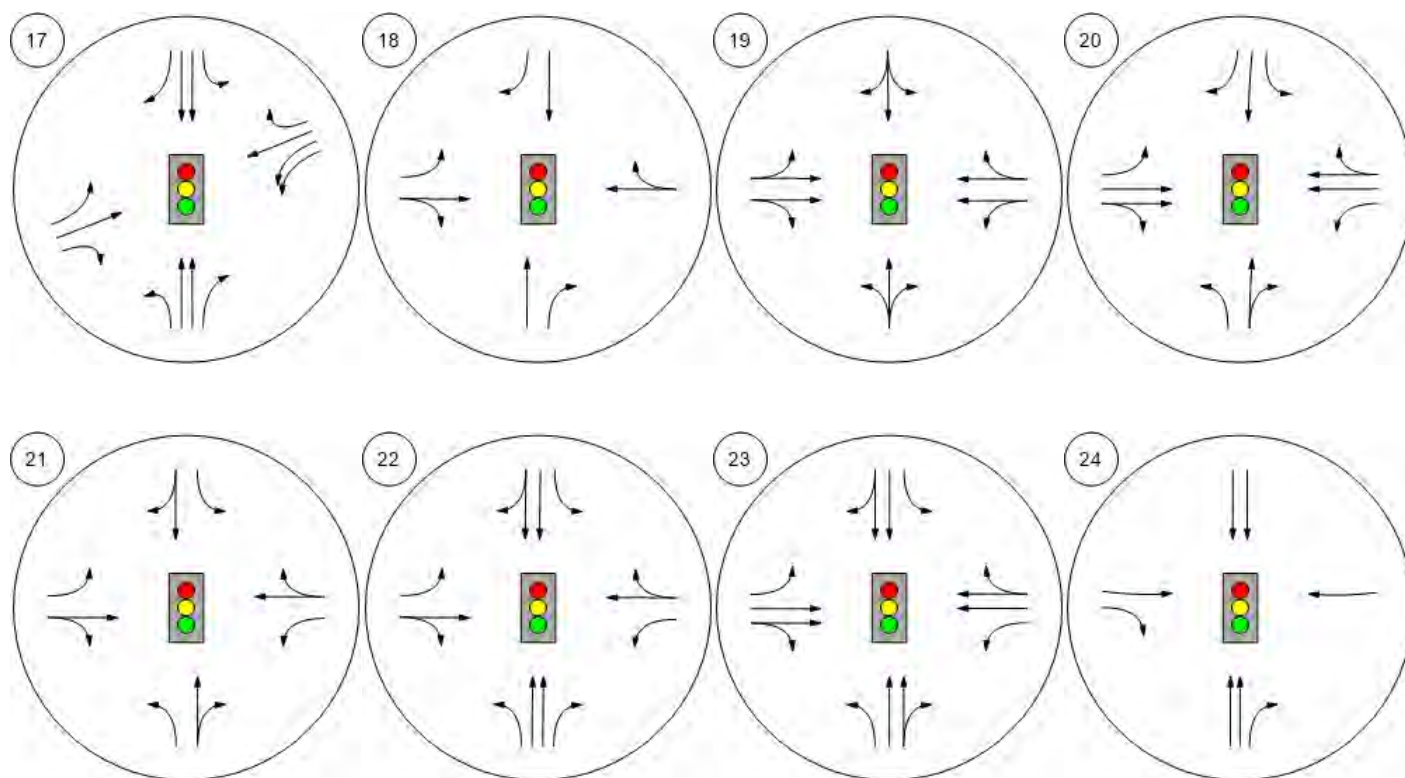
Lane Configuration and Traffic Control



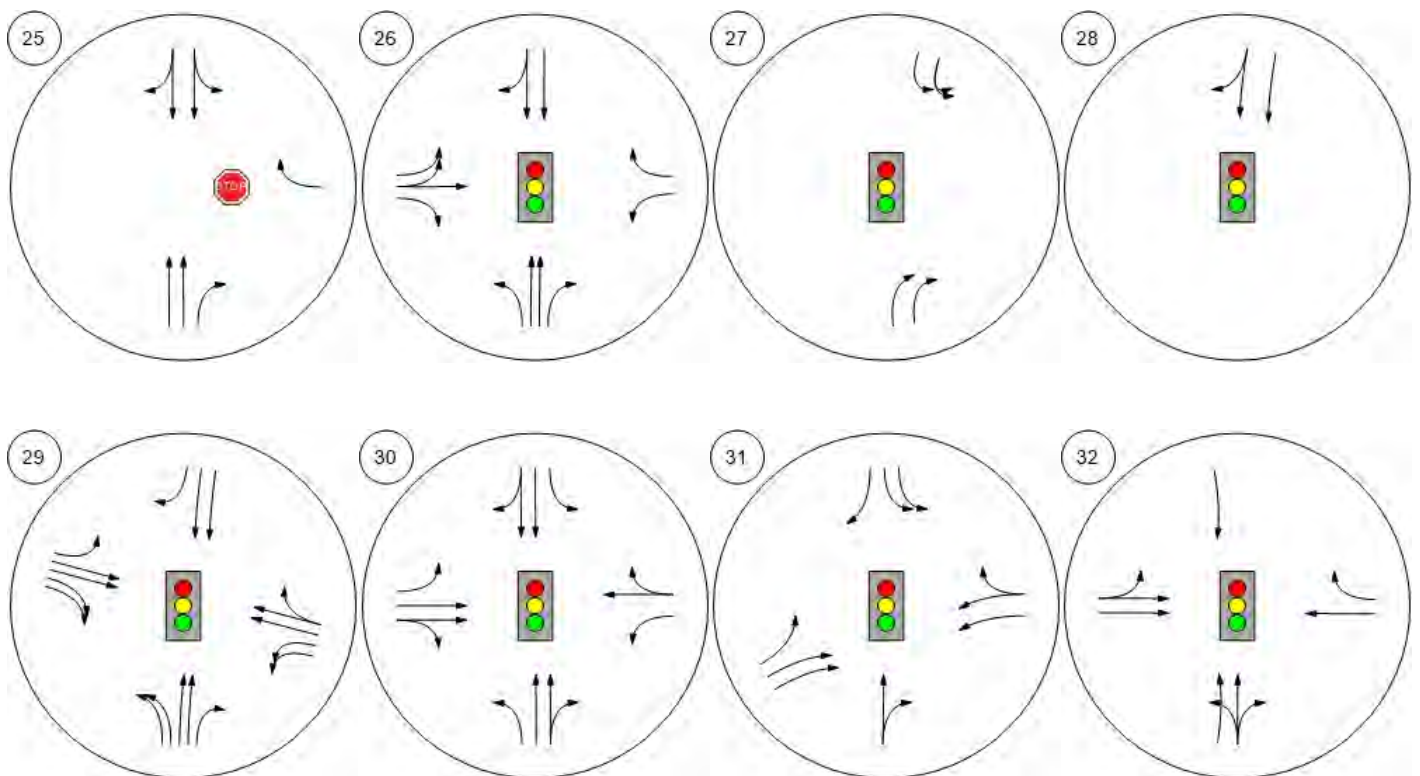
Lane Configuration and Traffic Control



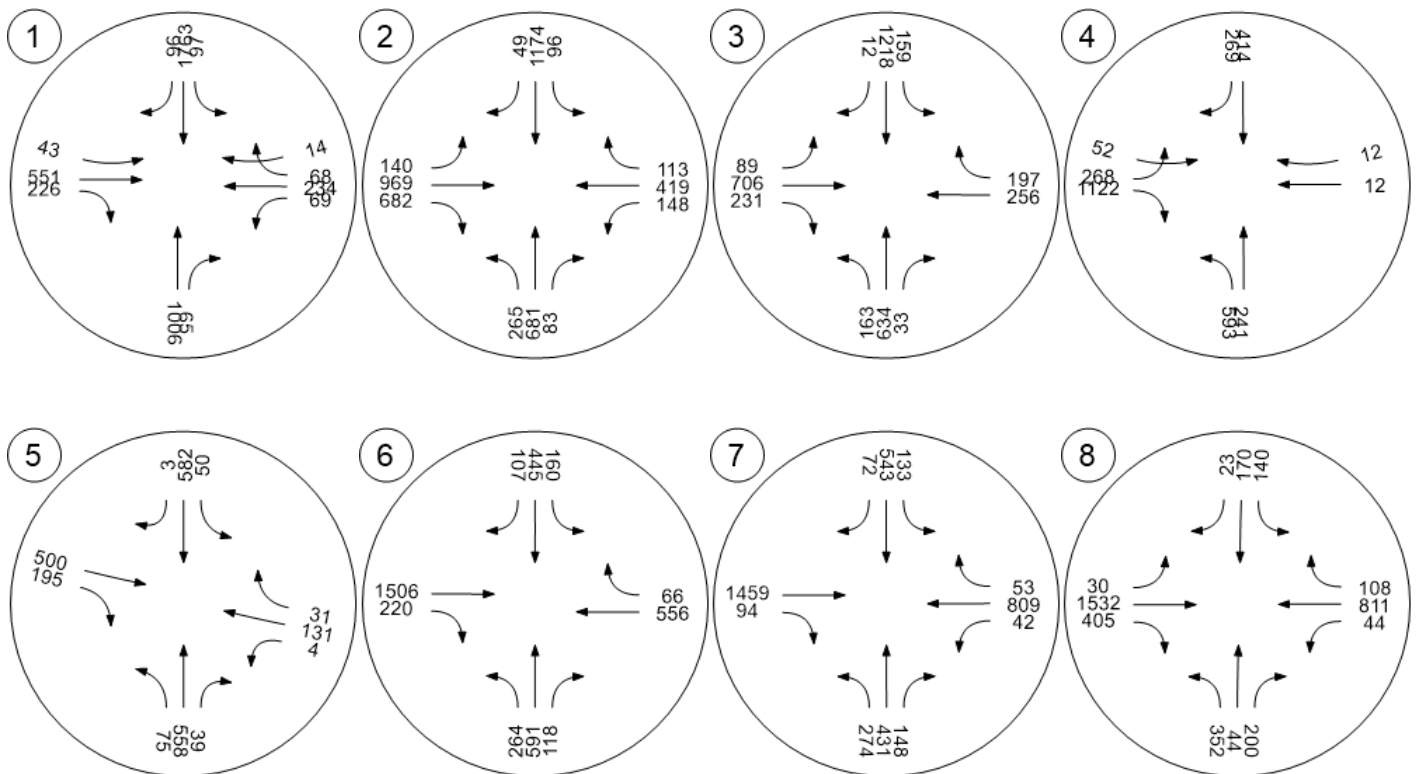
Lane Configuration and Traffic Control



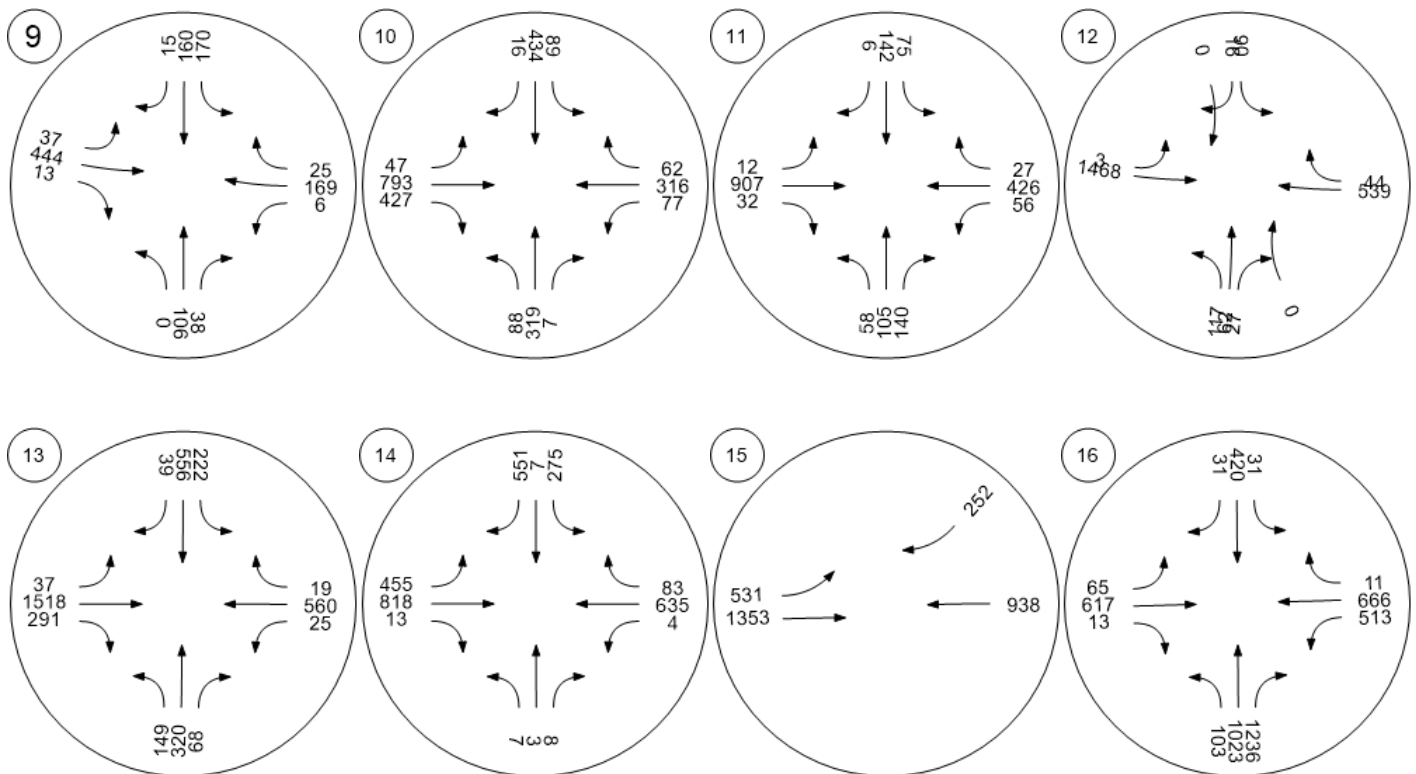
Lane Configuration and Traffic Control



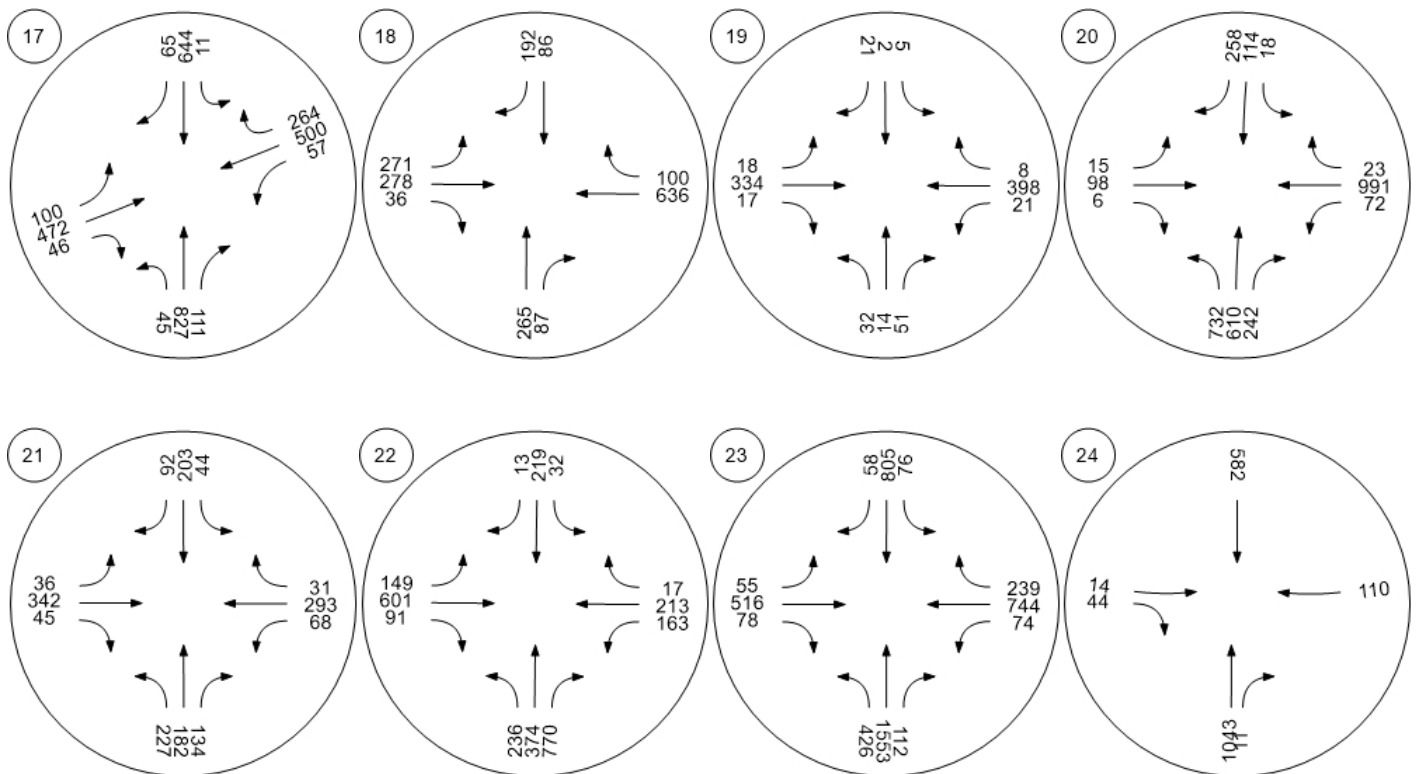
Traffic Volume - Base Volume



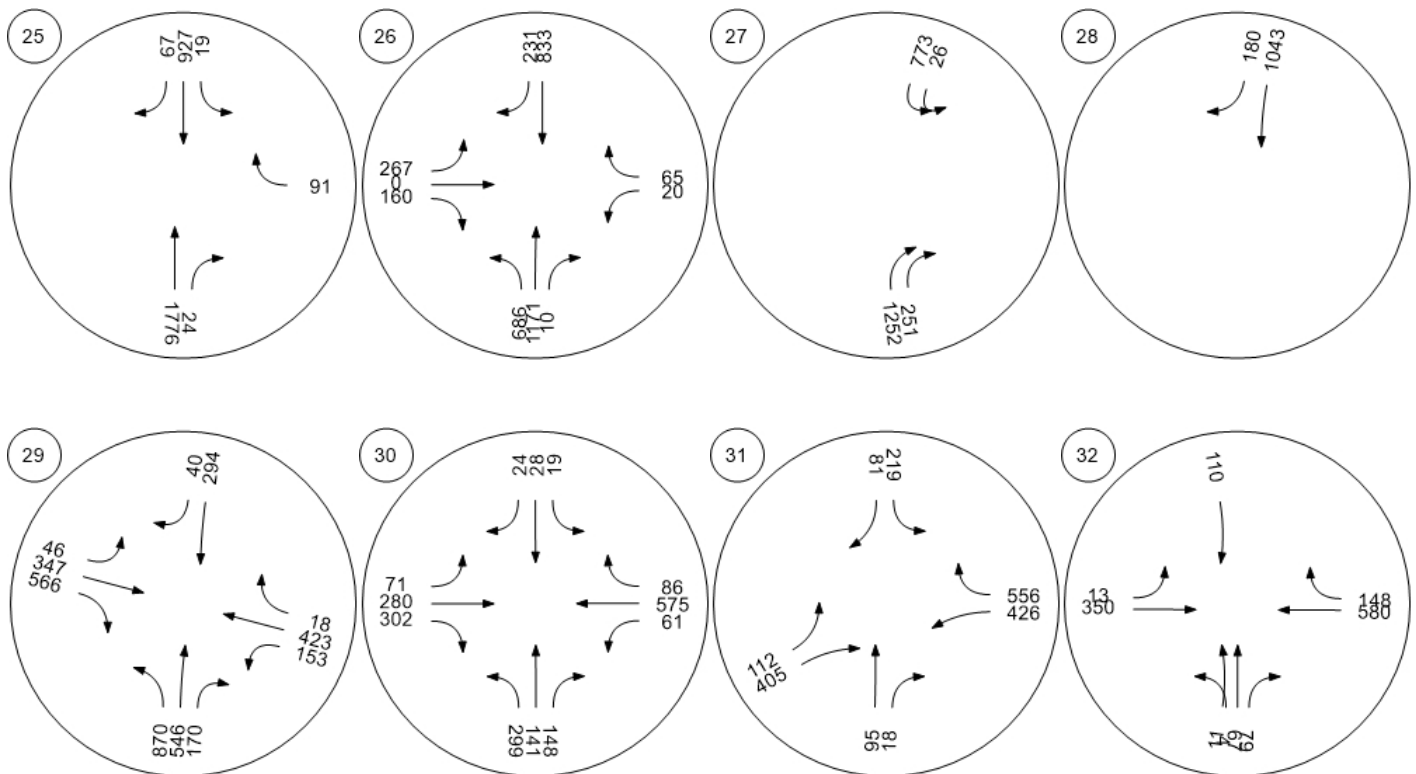
Traffic Volume - Base Volume



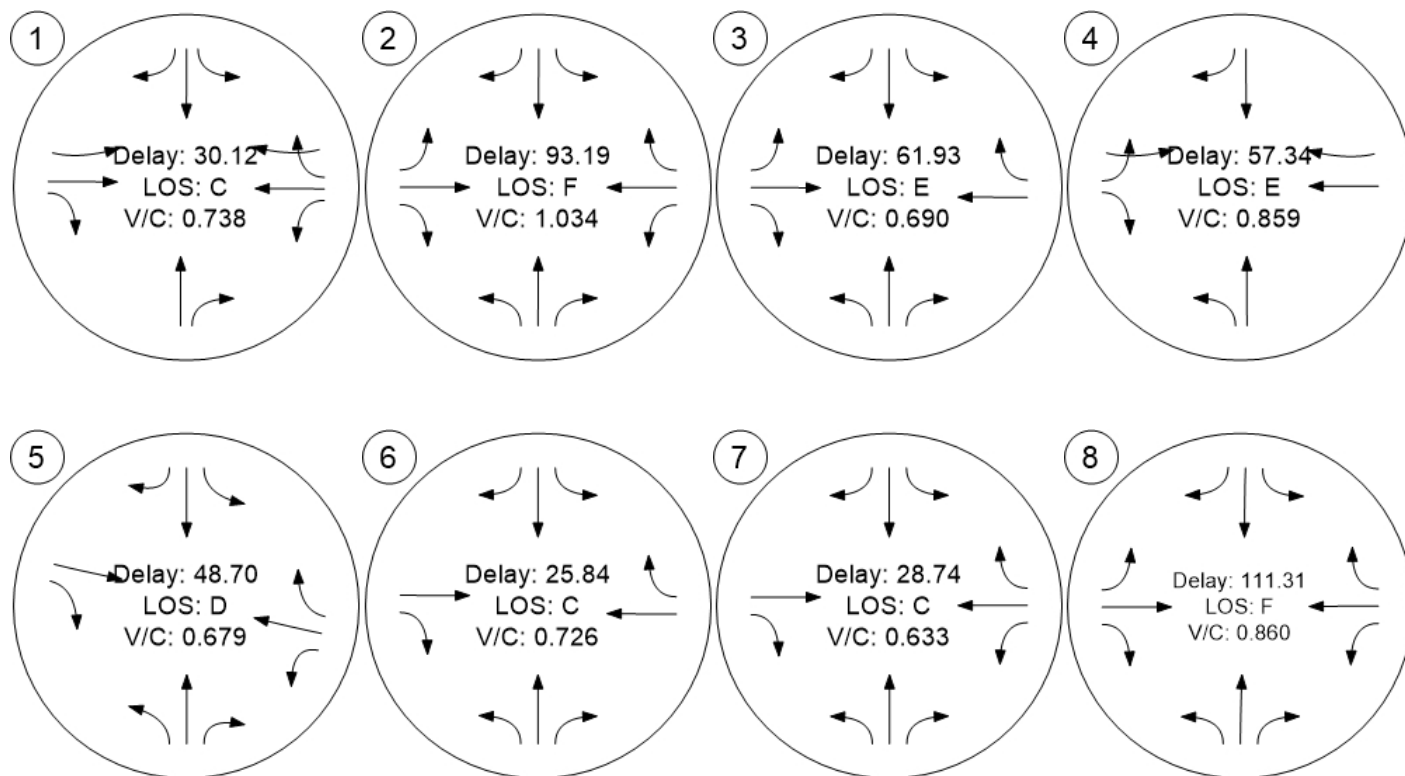
Traffic Volume - Base Volume



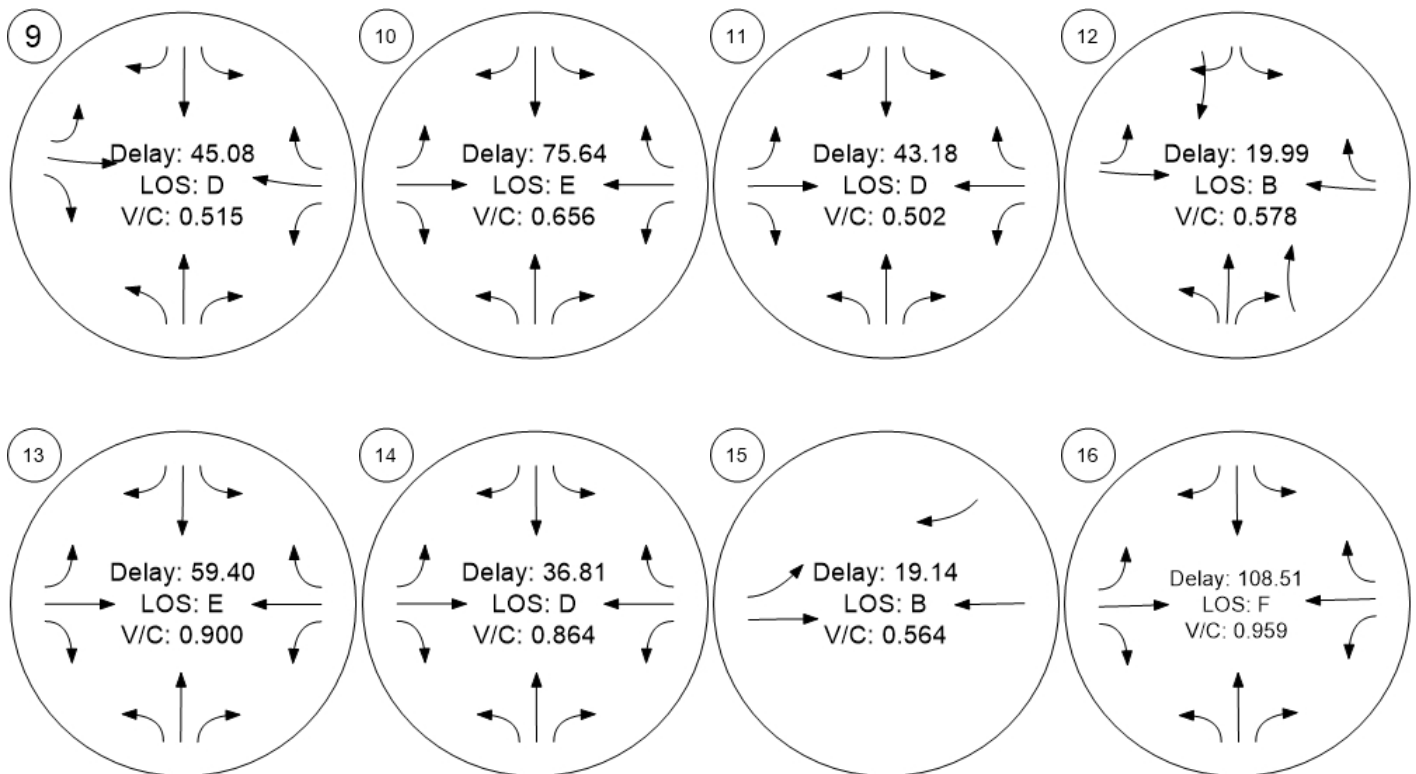
Traffic Volume - Base Volume



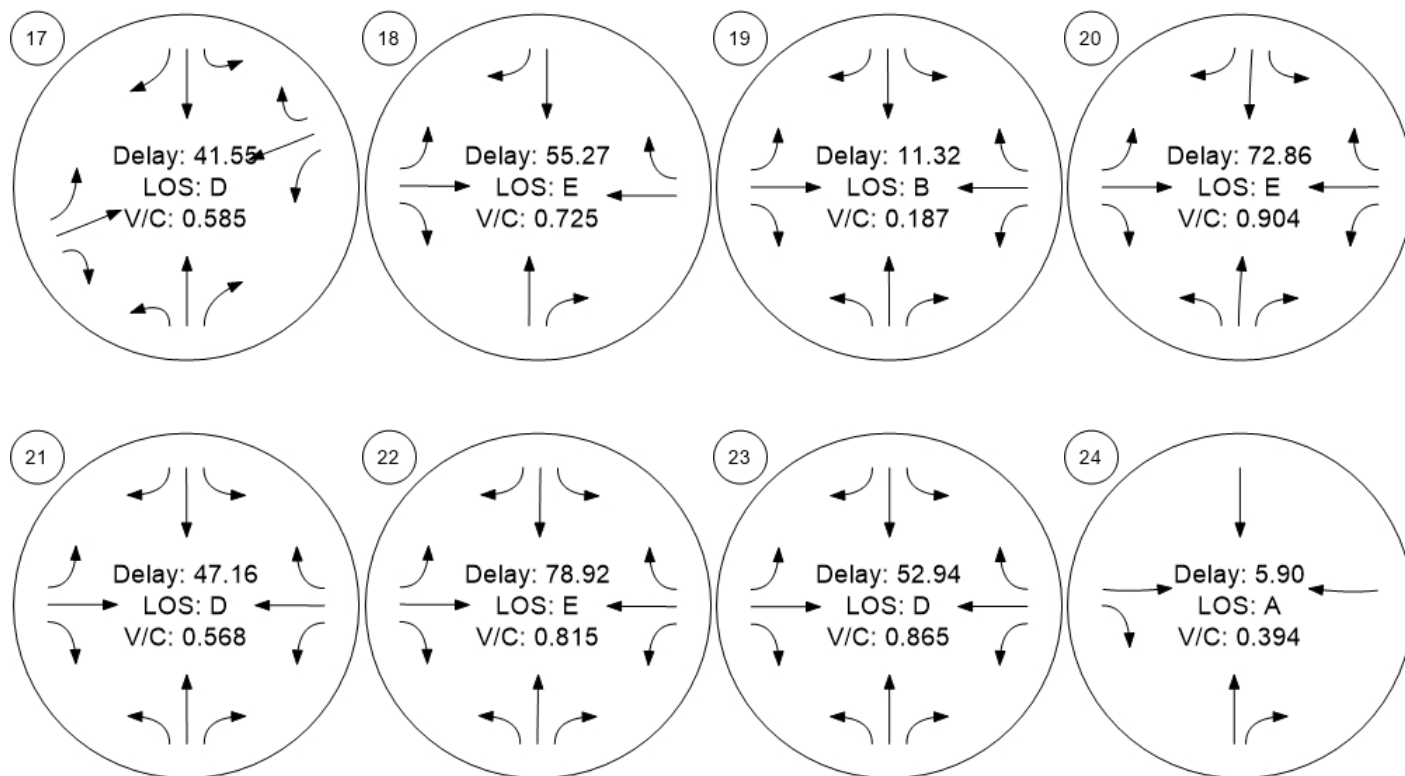
Traffic Conditions



Traffic Conditions



Traffic Conditions



Traffic Conditions

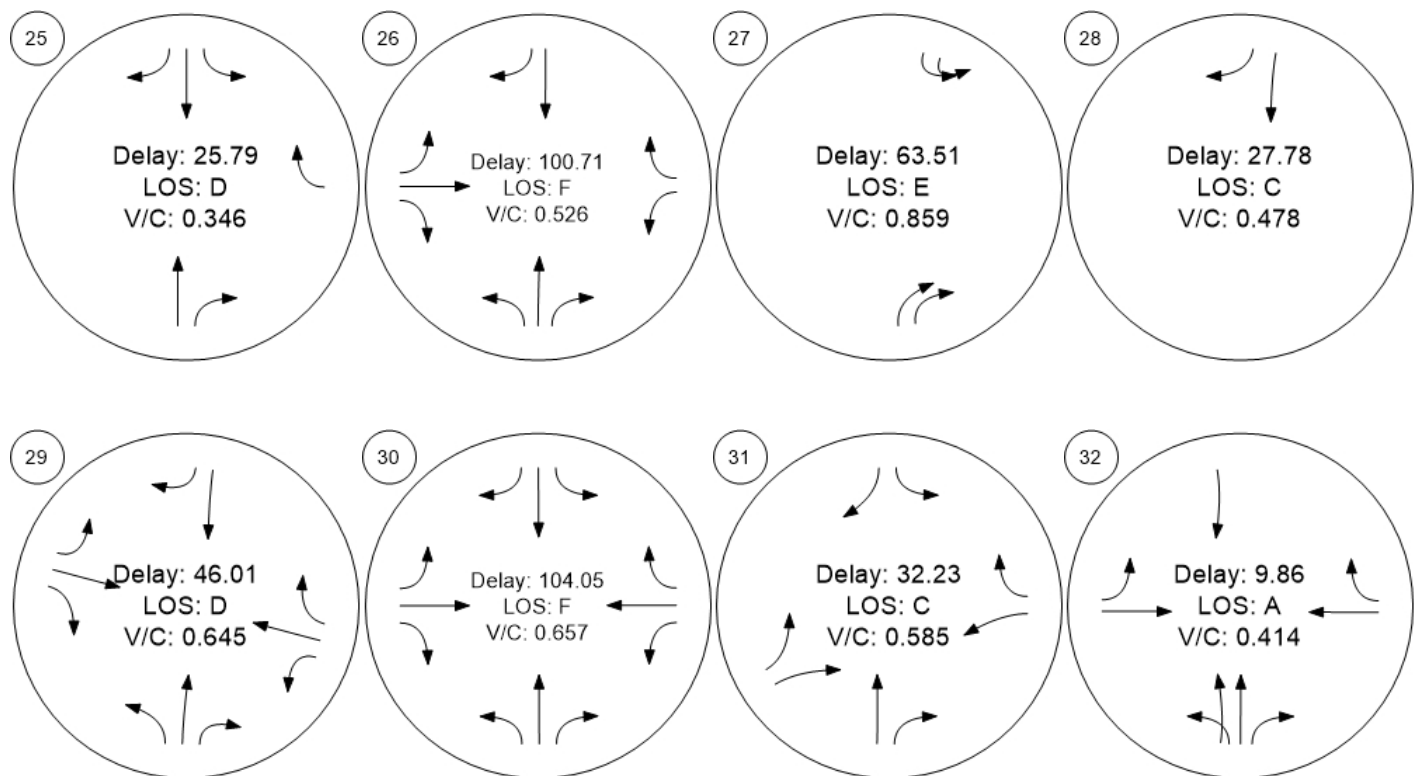


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Priority Growth Areas Mobility Study

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

Scenario 7 7 Post Development with Improvements PM
PeakReport File: Z:\...\Post Development with 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	0.619	36.4	D
2	Jasper Avenue and 109 Street	Signalized	HCM 7th Edition	NB Left	0.978	92.4	F
3	104 Avenue and 109 Street	Signalized	HCM 7th Edition	NB Left	0.738	76.7	E
4	102 Avenue and 124 Street	Signalized	HCM 7th Edition	NB Left	0.678	96.7	F
5	Stony Plain Road and 124 Street	Signalized	HCM 7th Edition	WB Left	0.651	39.4	D
6	107 Avenue and 124 Street	Signalized	HCM 7th Edition	WB Thru	0.850	51.2	D
7	111 Avenue and 124 Street	Signalized	HCM 7th Edition	WB Left	0.686	37.3	D
8	118 Avenue and 124 Street	Signalized	HCM 7th Edition	EB Left	0.661	33.7	C
9	104 Avenue and 121 Street	Signalized	HCM 7th Edition	SB Left	0.538	40.5	D
10	104 Avenue and 116 Street	Signalized	HCM 7th Edition	WB Right	0.829	116.9	F
11	104 Avenue and 112 Street	Signalized	HCM 7th Edition	NB Left	0.474	60.3	E
12	Jasper Avenue and 121 Street	Signalized	HCM 7th Edition	NB Left	0.642	34.7	C
13	Jasper Avenue and 116 Street	Signalized	HCM 7th Edition	EB Left	0.784	48.6	D
14	100 Avenue and 116 Street	Signalized	HCM 7th Edition	EB Left	0.732	38.8	D
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	EB Right	0.900	80.9	F
17	Stony Plain Road and 149 Street	Signalized	HCM 7th Edition	WB Thru	0.687	54.4	D

18	Stony Plain Road and 156 Street	Signalized	HCM 7th Edition	WB Thru	0.667	45.2	D
19	Stony Plain Road and 158 Street	Signalized	HCM 7th Edition	WB Right	0.245	12.4	B
20	Stony Plain Road and 163 Street	Signalized	HCM 7th Edition	WB Left	0.657	46.0	D
21	95 Avenue and 156 Street	Signalized	HCM 7th Edition	NB Left	0.483	43.8	D
22	87 Avenue and Meadowlark Road	Signalized	HCM 7th Edition	EB Thru	0.834	115.2	F
23	109 Street and 82 Ave	Signalized	HCM 7th Edition	EB Right	1.021	89.5	F
24	109 Street and 83 Ave	Signalized	HCM 7th Edition	SEB Left	0.444	10.4	B
25	109 Street and 86 Ave	Two-way stop	HCM 7th Edition	WB Right	0.094	15.4	C
26	109 Street and 87 Ave	Signalized	HCM 7th Edition	WB Left	1.073	188.9	F
27	109 Street and Walterdale Hill Road/Saskatchewan Drive	Signalized	HCM 7th Edition	SB Left	0.635	35.6	D
28	109 Street and 88 Ave SB	Signalized	HCM 7th Edition	SB Right	0.580	15.1	B
29	114 Street and 82 Ave	Signalized	HCM 7th Edition	SB Thru	0.652	55.0	D
30	114 Street and 87 Ave	Signalized	HCM 7th Edition	NB Left	0.833	131.9	F
31	112 Street and 82 Ave	Signalized	HCM 7th Edition	EB Left	0.752	40.6	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):	0.619

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	22	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	6	12	0	356	0	46
Total Analysis Volume [veh/h]	0	0	591	0	22	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	1567	1539	3076	1522
c, Capacity [veh/h]	909	444	361	1705	844
d1, Uniform Delay [s]	32.36	32.46	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]	1.61	3.40	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]	33.96	35.86	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]	4.65	4.88	1.11	9.27	9.61
50th-Percentile Queue Length [m/ln]	35.42	37.19	8.48	70.63	73.23
95th-Percentile Queue Length [veh/ln]	8.18	8.50	2.00	14.26	14.69
95th-Percentile Queue Length [m/ln]	62.37	64.79	15.26	108.68	111.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	34.55	0.00	35.86	34.08	0.00	19.03	0.00	20.40
Movement LOS			C		D	C		B		C
d_A, Approach Delay [s/veh]	34.60					19.63				
Approach LOS	C					B				
d_I, Intersection Delay [s/veh]	36.42									
Intersection LOS	D									
Intersection V/C	0.619									

Emissions

Vehicle Kilometers Traveled [km/h]	65.31	32.66	11.44	251.36	124.54
Stops [stops/h]	304.27	159.72	36.41	606.71	314.53
Fuel consumption [L/h]	23.73	12.33	3.19	52.95	27.29
CO [g/h]	438.21	227.77	58.94	977.67	503.87
NOx [g/h]	85.26	44.31	11.47	190.22	98.03
VOC [g/h]	101.56	52.79	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	2.892	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	1.898	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]	36.42									
Intersection LOS	D									
Intersection V/C	0.619									

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]	36.42									
Intersection LOS	D									
Intersection V/C	0.619									

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]	10.69	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):	92.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.978

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	90	68	1104	170	141	795	368	179	1367	174
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	23	17	276	43	35	199	92	45	342	44
Total Analysis Volume [veh/h]	186	439	90	68	1104	170	141	795	368	179	1367	174
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	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	5	1	0	5	1	0	2	4	0	3	4	0
Auxiliary Signal Groups												
Maximum Green [s]	12	34	0	12	34	0	8	39	0	8	39	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	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	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	4.0	0.0	1.0	4.0	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]	15	35	0	15	35	0	15	45	0	15	45	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	25	0	5	25	0	5	26	0	5	26	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		No	Yes		No	Yes	
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	R	L	C	C	L	C	C	R	L	C	R
C, Calculated Cycle Length [s]	110	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	3.00	5.00	5.00	3.00	6.00	6.00	6.00	3.00	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	0.00
l2, Clearance Lost Time [s]	1.00	3.00	3.00	1.00	3.00	3.00	1.00	4.00	4.00	4.00	1.00	4.00	4.00
g_i, Effective Green Time [s]	12	30	30	12	30	30	12	39	39	39	57	39	39
g / C, Green / Cycle	0.11	0.27	0.27	0.11	0.27	0.27	0.11	0.35	0.35	0.35	0.52	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.12	0.14	0.09	0.04	0.28	0.32	0.11	0.31	0.31	0.39	0.17	0.43	0.17
s, saturation flow rate [veh/h]	1539	3076	1038	1539	3076	1314	1266	1329	1304	893	1056	3204	1037
c, Capacity [veh/h]	168	839	283	168	839	358	138	471	462	317	547	1136	368
d1, Uniform Delay [s]	49.00	33.93	31.13	45.67	40.00	40.00	49.00	33.02	33.21	31.84	15.37	35.50	26.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.46	0.50	0.50	0.50	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	1.00	1.00
d2, Incremental Delay [s]	101.37	2.33	2.94	7.11	35.91	102.16	78.75	18.54	20.05	83.79	0.34	100.03	4.32
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	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	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	1.00

Lane Group Results

X, volume / capacity	1.11	0.52	0.32	0.41	1.02	1.17	1.02	0.86	0.87	1.11	0.33	1.20	0.47
d, Delay for Lane Group [s/veh]	150.37	36.26	34.07	52.79	75.91	142.16	127.7	51.57	53.26	115.6	15.72	135.53	30.55
Lane Group LOS	F	D	C	D	F	F	F	D	D	F	B	F	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.30	5.21	2.09	2.06	15.31	19.68	6.78	12.27	12.41	14.76	2.65	30.81	3.84
50th-Percentile Queue Length [m/ln]	70.89	39.70	15.92	15.70	116.66	149.94	51.70	93.50	94.59	112.5	20.22	234.75	29.28
95th-Percentile Queue Length [veh/ln]	14.89	8.95	3.76	3.71	21.98	29.44	11.15	18.02	18.19	22.47	4.78	44.85	6.92
95th-Percentile Queue Length [m/ln]	113.49	68.23	28.65	28.25	167.47	224.34	84.95	137.2	138.6	171.2	36.40	341.74	52.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	150.37	36.26	34.07	52.79	90.86	142.16	127.75	52.39	115.63	15.72	135.53	30.55
Movement LOS	F	D	C	D	F	F	F	D	F	B	F	C
d_A, Approach Delay [s/veh]	65.67			95.43			77.62			112.44		
Approach LOS	E			F			E			F		
d_I, Intersection Delay [s/veh]	92.43											
Intersection LOS	F											
Intersection V/C	0.978											

Emissions

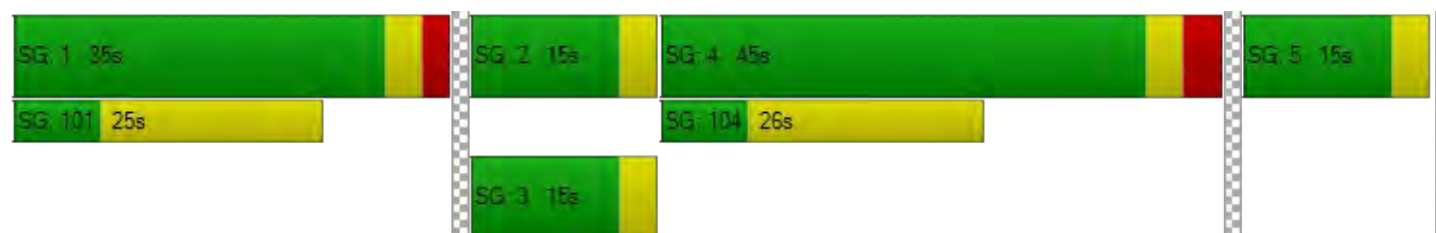
Vehicle Kilometers Traveled [km/h]	43.43	102.50	21.01	9.90	124.41	61.01	97.27	280.6	278.9	242.7	19.46	148.64	18.92
Stops [stops/h]	304.47	341.04	68.36	67.41	1002.12	643.96	222.0	401.5	406.2	483.1	86.86	2016.50	125.74
Fuel consumption [L/h]	32.50	29.66	5.89	5.22	84.30	66.14	28.11	51.87	52.24	65.28	5.48	187.40	7.91
CO [g/h]	600.19	547.78	108.84	96.36	1556.56	1221.38	519.0	957.7	964.6	1205.	101.16	3460.52	146.00
NOx [g/h]	116.78	106.58	21.18	18.75	302.85	237.64	100.9	186.3	187.6	234.5	19.68	673.29	28.41
VOC [g/h]	139.10	126.95	25.23	22.33	360.75	283.07	120.3	221.9	223.5	279.3	23.45	802.01	33.84

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]	2.55			2.15			4.56			5.67		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.964			2.845			3.034			2.850		
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]	545			545			709			709		
d_b, Bicycle Delay [s]	29.09			29.09			22.91			22.91		
I_b,int, Bicycle LOS Score for Intersection	2.157			2.307			2.666			2.993		
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):	76.7
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

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	28	101	1023	44	55	372	110	0	661	438
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	7	25	256	11	14	93	28	0	165	110
Total Analysis Volume [veh/h]	152	1121	28	101	1023	44	55	372	110	0	661	438
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	43	0	17	43	0	13	69	0	0	50	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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	43	43	17	43	43	13	69	69	50	50
g / C, Green / Cycle	0.11	0.27	0.27	0.11	0.27	0.27	0.08	0.43	0.43	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.10	0.26	0.26	0.07	0.24	0.24	0.04	0.15	0.16	0.22	0.34
s, saturation flow rate [veh/h]	1476	2951	1515	1476	2951	1491	1476	1683	1496	2951	1293
c, Capacity [veh/h]	157	793	407	157	793	401	120	726	645	922	404
d1, Uniform Delay [s]	71.24	57.52	57.73	68.60	56.19	56.52	70.14	30.37	30.66	48.72	52.70
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	22.50	36.41	18.59	14.08	26.36	12.11	1.29	1.57	4.76	69.14
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	0.97	0.95	0.96	0.64	0.89	0.90	0.46	0.34	0.36	0.72	1.08
d, Delay for Lane Group [s/veh]	135.35	80.02	94.14	87.19	70.27	82.88	82.25	31.65	32.23	53.48	121.84
Lane Group LOS	F	F	F	F	E	F	F	C	C	D	F
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	9.03	17.52	19.78	4.80	15.23	17.10	2.57	6.78	6.46	12.37	23.32
50th-Percentile Queue Length [m/ln]	68.79	133.49	150.71	36.57	116.06	130.28	19.57	51.68	49.19	94.29	177.70
95th-Percentile Queue Length [veh/ln]	13.95	24.38	27.07	8.39	21.63	23.88	4.62	11.05	10.62	18.14	32.90
95th-Percentile Queue Length [m/ln]	106.34	185.79	206.29	63.94	164.83	181.95	35.23	84.23	80.94	138.25	250.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	135.35	84.61	94.14	87.19	74.19	82.88	82.25	31.84	32.23	0.00	53.48	121.84
Movement LOS	F	F	F	F	E	F	F	C	C		D	F
d_A, Approach Delay [s/veh]	90.74			75.65			37.08			80.73		
Approach LOS	F			E			D			F		
d_I, Intersection Delay [s/veh]	76.75											
Intersection LOS	E											
Intersection V/C	0.738											

Emissions

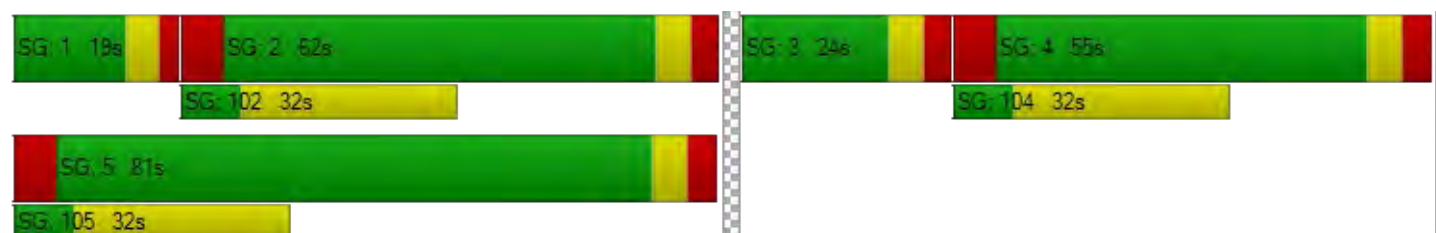
Vehicle Kilometers Traveled [km/h]	67.87	337.79	175.23	21.31	148.61	76.48	14.18	64.15	60.15	152.11	100.80
Stops [stops/h]	203.12	788.31	445.02	107.97	685.39	384.68	57.79	152.60	145.25	556.82	524.69
Fuel consumption [L/h]	26.86	96.45	55.11	11.23	67.64	39.05	6.13	15.59	14.77	54.19	62.46
CO [g/h]	495.97	1781.03	1017.66	207.40	1249.04	721.03	113.19	287.91	272.75	1000.71	1153.39
NOx [g/h]	96.50	346.52	198.00	40.35	243.02	140.29	22.02	56.02	53.07	194.70	224.41
VOC [g/h]	114.95	412.77	235.85	48.07	289.48	167.11	26.23	66.73	63.21	231.92	267.31

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]	7.44			1.67			8.79			9.06		
d_p, Pedestrian Delay [s]	69.38			69.38			69.38			69.38		
I_p,int, Pedestrian LOS Score for Intersectio	2.979			3.035			2.627			2.722		
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]	538			538			863			625		
d_b, Bicycle Delay [s]	42.78			42.78			25.88			37.81		
I_b,int, Bicycle LOS Score for Intersection	2.277			2.204			2.012			2.503		
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):	96.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

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]	1456	0	387	0	4	0	0	376	0	230
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	23
Total Hourly Volume [veh/h]	1456	0	387	0	4	0	0	376	0	230
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]	364	0	97	0	1	0	0	94	0	58
Total Analysis Volume [veh/h]	1456	0	387	0	4	0	0	376	0	230
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	0.0	0.0	0.0	1.0	0.0	0.0
Detector Length [m]	5.0	0.0	5.0	0.0	0.0	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		
Maximum Recall	No		No					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	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	0.61	0.76	0.25	0.18	0.20
s, saturation flow rate [veh/h]	1195	955	1532	1683	1484
c, Capacity [veh/h]	592	550	891	490	432
d1, Uniform Delay [s]	33.16	31.89	12.87	33.73	34.75
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]	117.51	157.95	1.54	5.78	9.18
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	1.23	1.32	0.43	0.62	0.70
d, Delay for Lane Group [s/veh]	150.67	189.84	14.41	39.50	43.93
Lane Group LOS	F	F	B	D	D
Critical Lane Group	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	28.58	32.38	5.48	7.71	8.23
50th-Percentile Queue Length [m/ln]	217.75	246.71	41.76	58.74	62.74
95th-Percentile Queue Length [veh/ln]	43.28	50.42	9.32	12.26	12.94
95th-Percentile Queue Length [m/ln]	329.82	384.24	71.01	93.43	98.60

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	170.26	0.00	14.41	0.00	0.00	0.00	0.00	40.36	0.00	43.93
Movement LOS	F		B					D		D
d_A, Approach Delay [s/veh]	137.53						41.72			
Approach LOS	F						D			
d_I, Intersection Delay [s/veh]	96.66									
Intersection LOS	F									
Intersection V/C	0.678									

Emissions

Vehicle Kilometers Traveled [km/h]	106.31	106.31	56.51	130.23	130.23
Stops [stops/h]	935.24	1059.59	179.35	252.27	269.47
Fuel consumption [L/h]	115.58	140.32	13.70	27.27	28.69
CO [g/h]	2134.17	2591.13	252.92	503.55	529.76
NOx [g/h]	415.23	504.14	49.21	97.97	103.07
VOC [g/h]	494.61	600.52	58.62	116.70	122.78

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]	0.00	20.18
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	2.906	2.613
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	3.080	2.079
Bicycle LOS	C	B

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	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					50.00				
Grade [%]	0.00					0.00				
Curb Present	Yes					Yes				
Crosswalk	Yes					Yes				

Volumes

Name						WB Bike Lane				
Base Volume Input [veh/h]	105	0	0	0	670	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	67	0	0	0	0	0
Total Hourly Volume [veh/h]	105	0	0	0	670	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]	26	0	0	0	168	0	0	0	14	0
Total Analysis Volume [veh/h]	105	0	0	0	670	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	Permissiv	Overlap	Permissiv	Permissiv	Permissiv	Permissiv	Permissiv
Signal Group	3	0	0	3	3	0	0	0	4	0
Auxiliary Signal Groups	3,4			3,4	3,4					
Maximum Green [s]	16	0	0	16	16	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	7	0	0	0	7	0
Pedestrian Clearance [s]	14	0	0	14	14	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	21	0	0	0	20	0
Lead / Lag	Lead	-	-	-	-	-	-	-	-	-
Minimum Green [s]	10	0	0	10	10	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	
Maximum Recall	Yes				Yes				Yes	
Pedestrian Recall	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	36	15
g / C, Green / Cycle	0.33	0.33	0.14
(v / s)_i Volume / Saturation Flow Rate	0.28	0.28	0.04
s, saturation flow rate [veh/h]	1387	1389	1373
c, Capacity [veh/h]	514	455	187
d1, Uniform Delay [s]	34.11	34.01	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]	10.18	17.20	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	0.76	0.84	0.29
d, Delay for Lane Group [s/veh]	44.29	51.21	46.55
Lane Group LOS	D	D	D
Critical Lane Group	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	10.85	11.41	1.52
50th-Percentile Queue Length [m/ln]	82.66	86.95	11.57
95th-Percentile Queue Length [veh/ln]	16.25	16.95	2.73
95th-Percentile Queue Length [m/ln]	123.81	129.16	20.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.29	0.00	0.00	0.00	48.26	0.00	0.00	0.00	46.55	0.00
Movement LOS	D				D				D	
d_A, Approach Delay [s/veh]	47.72					46.55				
Approach LOS	D					D				
d_I, Intersection Delay [s/veh]	96.66									
Intersection LOS	F									
Intersection V/C	0.678									

Emissions

Vehicle Kilometers Traveled [km/h]	113.33	111.09	5.86
Stops [stops/h]	355.00	373.42	49.70
Fuel consumption [L/h]	32.10	34.08	3.61
CO [g/h]	592.71	629.29	66.64
NOx [g/h]	115.32	122.44	12.97
VOC [g/h]	137.37	145.85	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]	15.41	27.36
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	3.181	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	2.949	1.560
Bicycle LOS	C	A

Intersection Setup										
Name						EB Bike Lane				
Approach	Northwestbound					Southeastbound				
Lane Configuration	1					1				
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	12	0	0	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	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	12	0	0	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	3	0	0	0	4	0	0	0
Total Analysis Volume [veh/h]	0	0	12	0	0	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	0.01	0.01
s, saturation flow rate [veh/h]	1683	1224
c, Capacity [veh/h]	229	65
d1, Uniform Delay [s]	41.32	42.52
k, delay calibration	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	0.43	8.68
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	0.05	0.24
d, Delay for Lane Group [s/veh]	41.75	51.20
Lane Group LOS	D	D
Critical Lane Group	No	No
50th-Percentile Queue Length [veh/ln]	0.31	0.55
50th-Percentile Queue Length [m/ln]	2.40	4.17
95th-Percentile Queue Length [veh/ln]	0.57	0.98
95th-Percentile Queue Length [m/ln]	4.31	7.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	41.75	0.00	0.00	0.00	51.20	0.00	0.00	0.00
Movement LOS			D				D			
d_A, Approach Delay [s/veh]	41.75					51.20				
Approach LOS	D					D				
d_I, Intersection Delay [s/veh]	96.66									
Intersection LOS	F									
Intersection V/C	0.678									

Emissions

Vehicle Kilometers Traveled [km/h]	1.88	1.77
Stops [stops/h]	10.29	17.89
Fuel consumption [L/h]	0.73	1.20
CO [g/h]	13.54	22.18
NOx [g/h]	2.63	4.31
VOC [g/h]	3.14	5.14

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]	117.32	10.84
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	1.729	1.763
Crosswalk LOS	A	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	1.579	1.560
Bicycle LOS	A	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):	39.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

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	95	203	391	12	0	238	81	36	442	117
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	24	51	98	3	0	60	20	9	111	29
Total Analysis Volume [veh/h]	154	500	95	203	391	12	0	238	81	36	442	117
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	0.20	0.21	0.21	0.13	0.13	0.20	0.02	0.35
s, saturation flow rate [veh/h]	1070	1550	1396	972	1550	1519	1577	1476	1604
c, Capacity [veh/h]	471	452	407	385	452	443	473	148	708
d1, Uniform Delay [s]	21.11	37.49	37.98	23.89	34.63	34.68	36.86	49.81	28.71
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]	1.85	7.87	10.10	5.10	3.19	3.31	7.50	3.89	8.71
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	0.68	0.71	0.53	0.45	0.45	0.67	0.24	0.79
d, Delay for Lane Group [s/veh]	22.95	45.36	48.09	28.99	37.81	38.00	44.35	53.70	37.42
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	8.85	8.70	4.17	5.21	5.19	9.14	1.16	15.17
50th-Percentile Queue Length [m/ln]	22.02	67.47	66.28	31.78	39.73	39.52	69.67	8.83	115.56
95th-Percentile Queue Length [veh/ln]	5.20	13.73	13.53	7.51	8.96	8.92	14.10	2.08	21.55
95th-Percentile Queue Length [m/ln]	39.63	104.65	103.13	57.20	68.27	67.98	107.46	15.89	164.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.95	46.42	48.09	28.99	37.90	38.00	0.00	44.35	44.35	53.70	37.42	37.42
Movement LOS	C	D	D	C	D	D		D	D	D	D	D
d_A, Approach Delay [s/veh]	41.81			34.92			44.35			38.40		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	39.43											
Intersection LOS	D											
Intersection V/C	0.651											

Emissions

Vehicle Kilometers Traveled [km/h]	66.19	131.28	124.46	92.48	92.21	91.38	99.03	12.32	191.32
Stops [stops/h]	86.68	265.62	260.93	125.11	156.43	155.60	274.30	34.75	454.97
Fuel consumption [L/h]	10.97	29.12	28.42	16.14	18.18	18.06	26.47	3.44	44.52
CO [g/h]	202.48	537.73	524.80	298.00	335.66	333.41	488.84	63.54	822.08
NOx [g/h]	39.39	104.62	102.11	57.98	65.31	64.87	95.11	12.36	159.95
VOC [g/h]	46.93	124.62	121.63	69.07	77.79	77.27	113.29	14.73	190.53

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]	14.31	13.04	14.85	12.65
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.585	2.565	2.280	2.448
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	2.186	2.060	2.099	2.561
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):	51.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.850

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	94	169	585	89	0	888	462	0	1457	120
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	24	42	146	22	0	222	116	0	364	30
Total Analysis Volume [veh/h]	184	660	94	169	585	89	0	888	462	0	1457	120
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	37	0	13	37	0	0	37	0	0	37	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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	47	0	16	47	0	0	47	0	0	47	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]	58	42	42	56	42	42	42	42	42
g / C, Green / Cycle	0.53	0.38	0.38	0.51	0.38	0.38	0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.18	0.21	0.21	0.17	0.37	0.25	0.30	0.42	0.08
s, saturation flow rate [veh/h]	1010	1870	1765	977	1811	3532	1520	3503	1589
c, Capacity [veh/h]	350	714	674	479	692	1349	580	1338	607
d1, Uniform Delay [s]	22.25	26.48	26.57	1.98	33.48	28.07	29.63	34.00	22.73
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]	5.55	0.65	0.75	0.44	26.11	2.53	10.84	52.64	0.73
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	0.53	0.54	0.55	0.35	0.97	0.66	0.80	1.09	0.20
d, Delay for Lane Group [s/veh]	27.81	27.13	27.32	2.42	59.58	30.60	40.47	86.64	23.46
Lane Group LOS	C	C	C	A	E	C	D	F	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.90	7.87	7.58	0.06	22.14	9.94	12.14	27.05	2.19
50th-Percentile Queue Length [m/ln]	22.12	59.99	57.74	0.45	168.73	75.73	92.50	206.09	16.72
95th-Percentile Queue Length [veh/ln]	5.22	12.47	12.09	0.11	29.86	15.11	17.85	37.75	3.95
95th-Percentile Queue Length [m/ln]	39.81	95.06	92.14	0.81	227.54	115.12	136.04	287.62	30.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.81	27.21	27.32	2.42	59.58	59.58	0.00	30.60	40.47	0.00	86.64	23.46
Movement LOS	C	C	C	A	E	E		C	D		F	C
d_A, Approach Delay [s/veh]	27.34			48.12			33.98			81.83		
Approach LOS	C			D			C			F		
d_I, Intersection Delay [s/veh]	51.22											
Intersection LOS	D											
Intersection V/C	0.850											

Emissions

Vehicle Kilometers Traveled [km/h]	83.82	175.52	167.97	149.38	595.74	212.34	110.48	418.64	34.48
Stops [stops/h]	94.99	257.66	247.97	1.92	724.69	650.48	397.28	1770.26	71.80
Fuel consumption [L/h]	14.05	30.53	29.30	14.57	103.87	55.73	33.82	176.76	7.06
CO [g/h]	259.39	563.79	541.11	269.06	1918.06	1029.08	624.57	3264.07	130.37
NOx [g/h]	50.47	109.69	105.28	52.35	373.18	200.22	121.52	635.07	25.36
VOC [g/h]	60.12	130.66	125.41	62.36	444.53	238.50	144.75	756.48	30.21

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]	1.98			26.20			13.35			15.79		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.734			2.568			3.113			2.973		
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]	673			673			673			673		
d_b, Bicycle Delay [s]	24.22			24.22			24.22			24.22		
I_b,int, Bicycle LOS Score for Intersection	2.341			2.965			2.711			2.871		
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):	37.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

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	126	202	646	88	5	1042	197	123	1661	119
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	32	51	162	22	1	261	49	31	415	30
Total Analysis Volume [veh/h]	181	508	126	202	646	88	5	1042	197	123	1661	119
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]	12	34	0	11	33	0	0	54	0	11	54	54
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]	40	29	29	40	27	27	49	49	49	60	60	60
g / C, Green / Cycle	0.37	0.27	0.27	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	0.18	0.18	0.20	0.21	0.21	0.25	0.25	0.25	0.55	0.40	0.40
s, saturation flow rate [veh/h]	1016	1840	1696	1013	1810	1719	1808	1674	1523	1060	1674	1616
c, Capacity [veh/h]	331	492	454	343	448	426	831	739	672	539	907	875
d1, Uniform Delay [s]	27.25	35.90	36.00	26.70	39.26	39.36	22.68	22.81	22.88	20.99	19.26	19.34
k, delay calibration	0.18	0.18	0.19	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]	2.36	2.60	3.03	7.21	4.19	4.63	2.50	3.07	3.44	63.36	5.35	5.67
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	0.55	0.67	0.67	0.59	0.84	0.84	0.54	0.56	0.57	1.08	0.74	0.74
d, Delay for Lane Group [s/veh]	29.61	38.50	39.03	33.91	43.45	43.98	25.19	25.87	26.32	84.35	24.61	25.01
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]	3.52	8.11	7.64	4.42	10.00	9.66	8.97	8.43	7.83	17.96	13.71	13.44
50th-Percentile Queue Length [m/ln]	26.80	61.78	58.23	33.67	76.23	73.60	68.32	64.24	59.63	136.86	104.49	102.43
95th-Percentile Queue Length [veh/ln]	6.33	12.78	12.18	7.87	15.19	14.76	13.88	13.19	12.41	26.44	19.79	19.45
95th-Percentile Queue Length [m/ln]	48.23	97.36	92.78	59.94	115.75	112.44	105.73	100.52	94.59	201.45	150.77	148.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.61	38.69	39.03	33.91	43.68	43.98	25.19	25.66	26.32	84.35	41.31	25.01
Movement LOS	C	D	D	C	D	D	C	C	C	F	D	C
d_A, Approach Delay [s/veh]	36.72			41.60			25.76			43.07		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	37.34											
Intersection LOS	D											
Intersection V/C	0.686											

Emissions

Vehicle Kilometers Traveled [km/h]	159.98	289.76	270.62	256.60	476.04	456.34	128.69	119.05	109.29	228.96	262.57	255.09
Stops [stops/h]	115.08	265.33	250.10	144.63	327.40	316.10	293.41	275.90	256.12	587.80	448.79	439.91
Fuel consumption [L/h]	21.93	43.24	40.56	32.93	65.18	62.68	27.53	25.78	23.86	72.89	47.74	46.66
CO [g/h]	404.98	798.51	749.03	608.16	1203.62	1157.45	508.28	476.10	440.65	1345.87	881.53	861.69
NOx [g/h]	78.79	155.36	145.73	118.33	234.18	225.20	98.89	92.63	85.74	261.86	171.51	167.65
VOC [g/h]	93.86	185.06	173.59	140.95	278.95	268.25	117.80	110.34	102.13	311.92	204.30	199.71

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			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	0.00			32.29			39.55			41.79		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.265			2.650			3.098			3.117		
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]	527			509			891			1091		
d_b, Bicycle Delay [s]	29.82			30.56			16.91			11.36		
I_b,int, Bicycle LOS Score for Intersection	2.243			2.339			2.255			2.613		
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):	33.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

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]	8	36	36	0	36	0	0	55	0	11	55	55
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]	38	38	30	30	49	49	49	60	60	60
g / C, Green / Cycle	0.35	0.35	0.27	0.27	0.45	0.45	0.45	0.55	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.15	0.15	0.08	0.04	0.08	0.39	0.41	0.19	0.43	0.44
s, saturation flow rate [veh/h]	2724	1582	1117	1672	324	1870	1610	599	1870	1795
c, Capacity [veh/h]	995	547	229	456	93	833	717	284	1020	979
d1, Uniform Delay [s]	27.77	27.69	43.49	30.34	50.02	27.63	28.69	22.01	19.79	20.17
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]	1.22	2.48	4.75	0.70	7.03	12.07	19.09	4.26	5.92	6.85
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
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	0.40	0.43	0.38	0.15	0.27	0.87	0.92	0.41	0.78	0.80
d, Delay for Lane Group [s/veh]	28.98	30.17	48.25	31.05	57.05	39.70	47.78	26.28	25.71	27.03
Lane Group LOS	C	C	D	C	E	D	D	C	C	C
Critical Lane Group	Yes	No	Yes	No	No	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.04	5.11	2.49	1.48	0.86	19.40	19.50	1.68	16.87	17.11
50th-Percentile Queue Length [m/ln]	30.78	38.94	18.95	11.26	6.55	147.82	148.59	12.82	128.52	130.38
95th-Percentile Queue Length [veh/ln]	7.27	8.82	4.48	2.66	1.55	26.62	26.74	3.03	23.60	23.89
95th-Percentile Queue Length [m/ln]	55.40	67.19	34.11	20.26	11.79	202.87	203.78	23.08	179.84	182.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.98	30.17	30.17	48.25	31.05	31.05	57.05	41.44	47.78	26.28	26.29	27.03
Movement LOS	C	C	C	D	C	C	E	D	D	C	C	C
d_A, Approach Delay [s/veh]	29.42			40.64			43.79			26.36		
Approach LOS	C			D			D			C		
d_I, Intersection Delay [s/veh]	33.74											
Intersection LOS	C											
Intersection V/C	0.661											

Emissions

Vehicle Kilometers Traveled [km/h]	509.38	299.79	6.00	4.76	7.37	213.90	194.78	30.76	212.93	209.66
Stops [stops/h]	264.36	167.24	81.39	48.35	28.14	634.89	638.20	55.07	551.98	559.97
Fuel consumption [L/h]	63.35	37.76	5.63	3.19	2.43	56.78	57.16	6.49	48.41	48.83
CO [g/h]	1169.78	697.27	103.96	58.86	44.89	1048.45	1055.45	119.84	893.86	901.67
NOx [g/h]	227.60	135.66	20.23	11.45	8.73	203.99	205.35	23.32	173.91	175.43
VOC [g/h]	271.11	161.60	24.09	13.64	10.40	242.99	244.61	27.77	207.16	208.97

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]	5.94	23.06	21.32	23.67
d_p, Pedestrian Delay [s]	41.89	41.89	43.65	43.65
I_p,int, Pedestrian LOS Score for Intersectio	2.579	2.121	3.306	3.105
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	545	891	1091
d_b, Bicycle Delay [s]	23.56	29.09	16.91	11.36
I_b,int, Bicycle LOS Score for Intersection	2.647	1.824	2.766	2.972
Bicycle LOS	B	A	C	C

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):	40.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

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	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	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	36	75	257	50	39	203	9	30	512	69
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	9	19	64	13	10	51	2	8	128	17
Total Analysis Volume [veh/h]	0	197	36	75	257	50	39	203	9	30	512	69
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	Protecte	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	L	C	R	L	C	L	C	R
C, Calculated Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	7.00	6.00	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
l2, Clearance Lost Time [s]	5.00	4.00	5.00	5.00	3.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	29	13	48	48	10	44	10	44	44
g / C, Green / Cycle	0.24	0.11	0.40	0.40	0.08	0.37	0.08	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.16	0.05	0.17	0.04	0.03	0.13	0.02	0.30	0.05
s, saturation flow rate [veh/h]	1484	1476	1550	1305	1476	1662	1476	1683	1294
c, Capacity [veh/h]	389	160	620	522	123	609	123	617	474
d1, Uniform Delay [s]	40.93	50.26	25.89	22.38	51.78	27.59	51.46	34.59	25.29
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]	6.69	9.56	2.04	0.36	6.65	1.57	4.65	12.25	0.64
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	0.60	0.47	0.41	0.10	0.32	0.35	0.24	0.83	0.15
d, Delay for Lane Group [s/veh]	47.62	59.81	27.93	22.75	58.43	29.15	56.12	46.84	25.93
Lane Group LOS	D	E	C	C	E	C	E	D	C
Critical Lane Group	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.90	2.54	5.61	0.94	1.33	4.68	1.00	15.48	1.40
50th-Percentile Queue Length [m/ln]	52.56	19.36	42.74	7.14	10.16	35.68	7.66	117.94	10.69
95th-Percentile Queue Length [veh/ln]	11.21	4.57	9.49	1.69	2.40	8.23	1.81	21.93	2.53
95th-Percentile Queue Length [m/ln]	85.38	34.86	72.34	12.85	18.29	62.73	13.78	167.10	19.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.62	47.62	47.62	59.81	27.93	22.75	58.43	29.15	29.15	56.12	46.84	25.93
Movement LOS	D	D	D	E	C	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	47.62			33.51			33.70			44.94		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	40.50											
Intersection LOS	D											
Intersection V/C	0.538											

Emissions

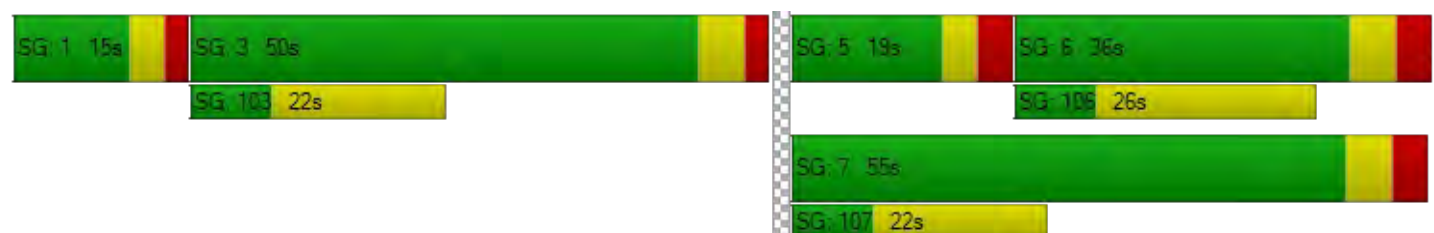
Vehicle Kilometers Traveled [km/h]	82.98	17.93	61.45	11.96	13.35	72.56	18.98	323.84	43.64
Stops [stops/h]	206.94	76.24	168.28	28.12	40.01	140.48	30.15	464.31	42.08
Fuel consumption [L/h]	21.08	6.87	15.15	2.64	3.92	14.82	3.78	59.70	6.47
CO [g/h]	389.30	126.89	279.78	48.83	72.44	273.58	69.77	1102.41	119.56
NOx [g/h]	75.74	24.69	54.44	9.50	14.09	53.23	13.57	214.49	23.26
VOC [g/h]	90.22	29.41	64.84	11.32	16.79	63.41	16.17	255.50	27.71

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	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	16.61	14.04	16.08	17.50
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.004	2.328	2.231	2.513
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	1.951	2.198	1.975	2.579
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):	116.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.829

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	29	81	566	8	143	341	162	72	513	350
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	41	18	128	88
Total Analysis Volume [veh/h]	98	310	29	81	566	8	143	341	162	72	513	350
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	Protecte	Permiss	Permiss	Protecte	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	35	0	17	42	0	17	29	0	17	29	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	3.00	7.00	7.00	3.00	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]	1.00	5.00	5.00	1.00	5.00	5.00	4.00	4.00	4.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	10	35	35	17	42	42	17	29	29	17	29	29
g / C, Green / Cycle	0.08	0.27	0.27	0.13	0.32	0.32	0.13	0.22	0.22	0.13	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.11	0.05	0.37	0.01	0.10	0.11	0.13	0.05	0.27	0.30
s, saturation flow rate [veh/h]	1476	1550	1480	1476	1550	1338	1476	3204	1296	1476	1683	1335
c, Capacity [veh/h]	114	417	398	193	501	432	193	715	289	193	375	298
d1, Uniform Delay [s]	59.32	39.02	39.15	51.96	44.00	29.95	54.38	43.91	44.25	51.63	50.50	50.50
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]	53.46	2.97	3.25	6.57	81.11	0.08	22.35	2.27	7.64	5.44	125.36	176.33
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	0.86	0.41	0.42	0.42	1.13	0.02	0.74	0.48	0.56	0.37	1.23	1.35
d, Delay for Lane Group [s/veh]	112.79	41.99	42.40	58.54	125.11	30.03	76.73	46.18	51.89	57.07	175.86	226.83
Lane Group LOS	F	D	D	E	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]	4.88	4.86	4.80	2.79	27.20	0.18	5.70	5.02	5.20	2.45	25.21	24.21
50th-Percentile Queue Length [m/ln]	37.17	37.04	36.55	21.27	207.26	1.39	43.47	38.25	39.65	18.64	192.12	184.49
95th-Percentile Queue Length [veh/ln]	8.50	8.48	8.39	5.02	38.65	0.33	9.62	8.69	8.94	4.40	37.30	37.26
95th-Percentile Queue Length [m/ln]	64.77	64.59	63.92	38.29	294.54	2.50	73.32	66.25	68.16	33.54	284.19	283.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	112.79	42.17	42.40	58.54	125.11	30.03	76.73	46.18	51.89	57.07	180.89	226.83
Movement LOS	F	D	D	E	F	C	E	D	D	E	F	F
d_A, Approach Delay [s/veh]	58.02			115.72			54.38			188.55		
Approach LOS	E			F			D			F		
d_I, Intersection Delay [s/veh]	116.94											
Intersection LOS	F											
Intersection V/C	0.829											

Emissions

Vehicle Kilometers Traveled [km/h]	47.77	83.49	81.75	17.74	123.94	1.75	90.45	215.68	102.47	35.30	226.67	196.44
Stops [stops/h]	135.07	134.61	132.82	77.30	753.21	5.05	157.97	278.00	144.09	67.73	698.21	670.45
Fuel consumption [L/h]	16.09	16.50	16.23	7.07	83.23	0.47	20.60	38.89	19.46	8.04	99.85	103.72
CO [g/h]	297.07	304.74	299.78	130.62	1536.88	8.59	380.41	718.08	359.27	148.52	1843.75	1915.31
NOx [g/h]	57.80	59.29	58.33	25.41	299.02	1.67	74.01	139.71	69.90	28.90	358.73	372.65
VOC [g/h]	68.85	70.63	69.48	30.27	356.19	1.99	88.16	166.42	83.26	34.42	427.31	443.89

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]	10.12			4.20			17.15			16.50		
d_p, Pedestrian Delay [s]	54.47			54.47			54.47			54.47		
I_p,int, Pedestrian LOS Score for Intersectio	2.575			2.621			2.709			2.655		
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]	538			646			446			446		
d_b, Bicycle Delay [s]	34.71			29.78			39.23			39.23		
I_b,int, Bicycle LOS Score for Intersection	1.923			2.642			2.106			2.360		
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):	60.3
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.474

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	35	17	94	18	5	447	60	46	671	55
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	9	4	24	5	1	112	15	12	168	14
Total Analysis Volume [veh/h]	168	116	35	17	94	18	5	447	60	46	671	55
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	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	5	0	7	5	0	1	3	0	1	3	0
Auxiliary Signal Groups												
Maximum Green [s]	16	29	0	16	29	0	20	34	0	20	34	0
Amber [s]	3.0	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]	1.0	2.0	0.0	1.0	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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	4.0	0.0	2.0	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]	20	40	0	20	40	0	25	45	0	25	45	0
Lead / Lag	Lag	-	-	Lag	-	-	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	No	Yes		No	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	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]	4.00	6.00	4.00	6.00	5.00	6.00	6.00	5.00	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
l2, Clearance Lost Time [s]	2.00	4.00	2.00	4.00	3.00	4.00	4.00	3.00	4.00	4.00
g_i, Effective Green Time [s]	16	29	16	29	20	34	34	20	34	34
g / C, Green / Cycle	0.12	0.22	0.12	0.22	0.15	0.26	0.26	0.15	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.11	0.10	0.01	0.08	0.00	0.15	0.16	0.03	0.22	0.22
s, saturation flow rate [veh/h]	1476	1450	1476	1479	1476	1683	1549	1476	1683	1595
c, Capacity [veh/h]	182	323	182	330	227	440	405	227	440	417
d1, Uniform Delay [s]	56.40	43.80	50.57	42.45	46.70	41.85	42.25	48.04	45.35	45.72
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]	49.44	4.78	1.02	2.78	0.18	5.60	6.84	2.00	16.89	19.98
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	0.92	0.47	0.09	0.34	0.02	0.59	0.62	0.20	0.84	0.86
d, Delay for Lane Group [s/veh]	105.84	48.58	51.59	45.23	46.87	47.45	49.08	50.04	62.24	65.69
Lane Group LOS	F	D	D	D	D	D	D	D	E	E
Critical Lane Group	Yes	Yes	No	No	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	8.00	4.71	0.55	3.33	0.15	7.90	7.82	1.44	13.23	13.28
50th-Percentile Queue Length [m/ln]	60.93	35.90	4.19	25.40	1.14	60.23	59.62	10.96	100.81	101.23
95th-Percentile Queue Length [veh/ln]	12.63	8.27	0.99	6.00	0.27	12.51	12.41	2.59	19.19	19.26
95th-Percentile Queue Length [m/ln]	96.27	63.03	7.55	45.71	2.06	95.36	94.58	19.72	146.26	146.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	105.84	48.58	48.58	51.59	45.23	45.23	46.87	48.14	49.08	50.04	63.80	65.69
Movement LOS	F	D	D	D	D	D	D	D	D	D	E	E
d_A, Approach Delay [s/veh]	78.74			46.06			48.24			63.11		
Approach LOS	E			D			D			E		
d_I, Intersection Delay [s/veh]	60.33											
Intersection LOS	E											
Intersection V/C	0.474											

Emissions

Vehicle Kilometers Traveled [km/h]	47.66	42.83	1.63	10.74	2.45	126.30	122.27	4.86	38.81	37.83
Stops [stops/h]	221.42	130.47	15.24	92.30	4.15	218.88	216.67	39.82	366.35	367.88
Fuel consumption [L/h]	21.93	12.07	1.07	6.37	0.51	26.34	25.92	3.13	29.54	29.98
CO [g/h]	404.92	222.79	19.71	117.54	9.36	486.43	478.68	57.76	545.39	553.67
NOx [g/h]	78.78	43.35	3.83	22.87	1.82	94.64	93.13	11.24	106.11	107.72
VOC [g/h]	93.84	51.63	4.57	27.24	2.17	112.74	110.94	13.39	126.40	128.32

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]	11.24	11.33	16.74	16.38
d_p, Pedestrian Delay [s]	54.47	54.47	54.47	54.47
I_p,int, Pedestrian LOS Score for Intersectio	2.106	2.045	2.604	2.585
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]	446	446	523	523
d_b, Bicycle Delay [s]	39.23	39.23	35.45	35.45
I_b,int, Bicycle LOS Score for Intersection	2.093	1.776	1.987	2.201
Bicycle LOS	B	A	A	B

Sequence

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



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

Control Type:	Signalized	Delay (sec / veh):	34.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

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	32	86	0	0	0	0	0	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	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	8	22	0	0	0	0	0	7
Total Analysis Volume [veh/h]	281	0	0	0	63	0	32	86	0	0	0	0	0	26
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	5	0	0	0	2	0	0	2	0	0	0	0	0	0
Auxiliary Signal Groups														
Maximum Green [s]	5	0	0	0	28	0	0	28	0	0	0	0	0	0
Amber [s]	3.0	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]	1.0	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]	2.0	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]	2.0	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]	1.0	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]	5.0	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]	114	0	0	0	52	0	0	52	0	0	0	0	0	0
Lead / Lag	Lead	-	-	-	-	-	-	Lag	-	-	-	-	-	-
Minimum Green [s]	5	0	0	0	15	0	0	15	0	0	0	0	0	0
Vehicle Extension [s]	3.0	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]	110	110	110
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]	46	46	46
g / C, Green / Cycle	0.42	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.22	0.06	0.11
s, saturation flow rate [veh/h]	1275	1558	1044
c, Capacity [veh/h]	444	651	495
d1, Uniform Delay [s]	34.85	19.83	24.06
k, delay calibration	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	6.70	0.47	1.06
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	0.15	0.23
d, Delay for Lane Group [s/veh]	41.55	20.30	25.12
Lane Group LOS	D	C	C
Critical Lane Group	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.51	1.59	2.18
50th-Percentile Queue Length [m/ln]	57.23	12.09	16.62
95th-Percentile Queue Length [veh/ln]	12.00	2.86	3.93
95th-Percentile Queue Length [m/ln]	91.47	21.77	29.92

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.55	0.00	0.00	0.00	20.30	0.00	20.30	25.12	0.00	0.00	0.00	0.00	0.00	25.12
Movement LOS	D				C		C	C						C
d_A, Approach Delay [s/veh]	36.18							25.12						
Approach LOS	D							C						
d_I, Intersection Delay [s/veh]	34.73													
Intersection LOS	C													
Intersection V/C	0.642													

Emissions

Vehicle Kilometers Traveled [km/h]	34.46	11.65	26.40
Stops [stops/h]	245.79	51.94	71.39
Fuel consumption [L/h]	17.78	3.76	6.28
CO [g/h]	328.41	69.41	115.98
NOx [g/h]	63.90	13.51	22.57
VOC [g/h]	76.11	16.09	26.88

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	462.66	301.66
M_CW, Crosswalk Circulation Area [m²/ped]	39.66	18.39
d_p, Pedestrian Delay [s]	41.89	41.89
I_p,int, Pedestrian LOS Score for Intersectio	1.918	1.878
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	782	782
d_b, Bicycle Delay [s]	20.40	20.40
I_b,int, Bicycle LOS Score for Intersection	2.185	1.749
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	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	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	17
Total Analysis Volume [veh/h]	13	0	0	799	0	0	0	0	0	0	1331	0	0	66
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	58	0	0	0	0	0	0	58	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]	110	110	110	110
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]	52	52	52	52
g / C, Green / Cycle	0.47	0.47	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.31	0.30	0.42	0.42
s, saturation flow rate [veh/h]	1171	1495	1683	1655
c, Capacity [veh/h]	587	707	796	783
d1, Uniform Delay [s]	20.72	21.98	26.14	26.45
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]	4.63	4.48	13.14	14.67
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	0.61	0.64	0.88	0.89
d, Delay for Lane Group [s/veh]	25.35	26.45	39.28	41.12
Lane Group LOS	C	C	D	D
Critical Lane Group	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.77	9.49	18.64	19.11
50th-Percentile Queue Length [m/ln]	51.61	72.33	142.03	145.64
95th-Percentile Queue Length [veh/ln]	11.04	14.54	25.72	26.28
95th-Percentile Queue Length [m/ln]	84.13	110.83	195.98	200.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	25.35	0.00	0.00	25.98	0.00	0.00	0.00	0.00	0.00	0.00	40.15	0.00	0.00	41.12
Movement LOS	C			C							D			D
d_A, Approach Delay [s/veh]	25.97							40.20						
Approach LOS	C							D						
d_I, Intersection Delay [s/veh]	34.73													
Intersection LOS	C													
Intersection V/C	0.642													

Emissions

Vehicle Kilometers Traveled [km/h]	128.90	164.08	385.67	385.67
Stops [stops/h]	221.66	310.65	610.01	625.51
Fuel consumption [L/h]	24.21	31.85	71.51	72.85
CO [g/h]	447.12	588.06	1320.49	1345.24
NOx [g/h]	86.99	114.42	256.92	261.73
VOC [g/h]	103.63	136.29	306.04	311.77

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m ² /ped]	110.33	0.00
M_CW, Crosswalk Circulation Area [m ² /ped]	0.00	18.02
d_p, Pedestrian Delay [s]	41.89	41.89
I_p,int, Pedestrian LOS Score for Intersectio	3.157	2.857
Crosswalk LOS	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	945	945
d_b, Bicycle Delay [s]	15.29	15.29
I_b,int, Bicycle LOS Score for Intersection	2.230	2.718
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]	34.73													
Intersection LOS	C													
Intersection V/C	0.642													

Emissions

Other Modes

g_Walk,mi, Effective Walk Time [s]	14.0	14.0
M_corner, Corner Circulation Area [m²/ped]	467.64	301.66
M_CW, Crosswalk Circulation Area [m²/ped]	21.09	13.66
d_p, Pedestrian Delay [s]	41.89	41.89
I_p,int, Pedestrian LOS Score for Intersectio	1.430	1.430
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]	55.00	55.00
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	52	0	0	0	0	0	0	52	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]	110	110
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]	46	46
g / C, Green / Cycle	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.00	0.00
s, saturation flow rate [veh/h]	1373	1616
c, Capacity [veh/h]	574	676
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]	34.73													
Intersection LOS	C													
Intersection V/C	0.642													

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]	21.09	13.66
d_p, Pedestrian Delay [s]	41.89	41.89
I_p,int, Pedestrian LOS Score for Intersectio	1.430	1.430
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	782	782
d_b, Bicycle Delay [s]	20.40	20.40
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):	48.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

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	50	125	341	125	74	978	121	157	1472	41
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	13	31	85	31	19	245	30	39	368	10
Total Analysis Volume [veh/h]	179	405	50	125	341	125	74	978	121	157	1472	41
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	0.28	0.13	0.14	0.15	0.24	0.33	0.34	0.13	0.45	0.46
s, saturation flow rate [veh/h]	968	1643	969	1683	1491	311	1683	1606	1175	1683	1648
c, Capacity [veh/h]	403	568	306	581	515	65	643	613	168	796	779
d1, Uniform Delay [s]	13.72	32.58	23.00	27.53	27.72	55.00	31.49	31.65	17.25	27.83	28.21
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]	3.52	11.35	3.99	2.19	2.65	151.25	15.03	16.46	54.68	22.33	25.45
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	0.44	0.80	0.41	0.42	0.43	1.13	0.87	0.88	0.94	0.95	0.97
d, Delay for Lane Group [s/veh]	17.24	43.94	26.99	29.72	30.37	206.25	46.52	48.10	71.93	50.16	53.66
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	Yes	Yes
50th-Percentile Queue Length [veh/ln]	2.60	12.53	2.28	5.19	4.87	4.56	16.06	15.76	4.84	23.12	23.86
50th-Percentile Queue Length [m/ln]	19.83	95.47	17.35	39.52	37.11	34.73	122.41	120.08	36.86	176.19	181.79
95th-Percentile Queue Length [veh/ln]	4.68	18.33	4.10	8.92	8.49	8.20	22.64	22.27	8.45	31.01	31.87
95th-Percentile Queue Length [m/ln]	35.69	139.71	31.23	67.98	64.69	62.52	172.50	169.69	64.35	236.28	242.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.24	43.94	43.94	26.99	29.91	30.37	206.25	47.20	48.10	71.93	51.86	53.66
Movement LOS	B	D	D	C	C	C	F	D	D	E	D	D
d_A, Approach Delay [s/veh]	36.40			29.39			57.32			53.79		
Approach LOS	D			C			E			D		
d_I, Intersection Delay [s/veh]	48.55											
Intersection LOS	D											
Intersection V/C	0.784											

Emissions

Vehicle Kilometers Traveled [km/h]	41.96	106.67	12.63	24.49	22.61	5.70	43.13	41.55	25.68	124.00	123.43
Stops [stops/h]	85.15	410.05	74.51	169.72	159.40	149.17	525.74	515.75	158.33	756.73	780.76
Fuel consumption [L/h]	8.28	34.75	5.47	11.69	10.96	15.64	35.95	35.50	14.69	58.07	60.45
CO [g/h]	152.91	641.60	101.05	215.78	202.38	288.87	663.90	655.61	271.30	1072.32	1116.27
NOx [g/h]	29.75	124.83	19.66	41.98	39.37	56.20	129.17	127.56	52.78	208.63	217.19
VOC [g/h]	35.44	148.70	23.42	50.01	46.90	66.95	153.86	151.94	62.88	248.52	258.71

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]	30.36			8.47			24.39			36.14		
d_p, Pedestrian Delay [s]	41.89			41.89			41.89			41.89		
I_p,int, Pedestrian LOS Score for Intersectio	2.472			2.547			3.013			2.949		
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	2.614			2.058			2.537			2.941		
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):	38.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.732

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	9	141	3	454	505	420	35	8	965	98
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	114	126	105	9	2	241	25
Total Analysis Volume [veh/h]	26	26	9	141	3	454	505	420	35	8	965	98
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	30	0	0	30	29	29	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
C, Calculated Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	0.00	0.00	3.00	3.00
g_i, Effective Green Time [s]	25	25	56	75	75	46	46
g / C, Green / Cycle	0.23	0.23	0.51	0.68	0.68	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.29	0.82	0.34	0.31	0.31
s, saturation flow rate [veh/h]	811	1147	1563	614	1321	1861	1624
c, Capacity [veh/h]	231	325	795	466	901	811	679
d1, Uniform Delay [s]	35.26	38.65	18.55	25.04	8.49	26.75	26.96
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]	2.77	4.31	2.97	66.44	2.02	5.01	7.11
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	0.26	0.44	0.57	1.08	0.51	0.70	0.74
d, Delay for Lane Group [s/veh]	38.03	42.96	21.52	91.48	10.51	31.76	34.07
Lane Group LOS	D	D	C	F	B	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.48	3.88	8.32	13.32	5.22	13.26	12.14
50th-Percentile Queue Length [m/ln]	11.30	29.56	63.44	101.50	39.76	101.02	92.52
95th-Percentile Queue Length [veh/ln]	2.67	6.98	13.06	20.54	8.96	19.23	17.86
95th-Percentile Queue Length [m/ln]	20.35	53.20	99.49	156.51	68.31	146.52	136.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.03	38.03	38.03	42.96	42.96	21.52	91.48	10.51	10.51	31.76	32.73	34.07
Movement LOS	D	D	D	D	D	C	F	B	B	C	C	C
d_A, Approach Delay [s/veh]	38.03			26.69			53.10			32.84		
Approach LOS	D			C			D			C		
d_I, Intersection Delay [s/veh]	38.82											
Intersection LOS	D											
Intersection V/C	0.732											

Emissions

Vehicle Kilometers Traveled [km/h]	2.95	33.76	106.43	79.56	71.68	88.72	78.40
Stops [stops/h]	48.55	126.95	272.45	435.92	170.77	433.86	397.36
Fuel consumption [L/h]	3.16	10.82	23.77	52.93	14.34	32.08	29.56
CO [g/h]	58.29	199.88	438.85	977.33	264.74	592.44	545.82
NOx [g/h]	11.34	38.89	85.38	190.15	51.51	115.27	106.20
VOC [g/h]	13.51	46.32	101.71	226.51	61.35	137.30	126.50

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]	21.77	8.66	0.00	21.67
d_p, Pedestrian Delay [s]	41.89	41.89	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	1.791	2.839	2.803	2.772
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]	455	455	1364	836
d_b, Bicycle Delay [s]	32.84	32.84	5.57	18.62
I_b,int, Bicycle LOS Score for Intersection	1.662	2.621	2.355	2.451
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):	80.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.900

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	1	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	6	75	519	32	1405	730	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]	4	165	81	3	232	2	19	130	8	351	183	15
Total Analysis Volume [veh/h]	14	661	322	10	928	6	75	519	32	1405	730	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	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]	12	61	0	0	49	0	15	30	0	69	84	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	C	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]	54	54	54	42	42	42	10	23	23	64	78	78
g / C, Green / Cycle	0.34	0.34	0.34	0.26	0.26	0.26	0.06	0.14	0.14	0.40	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.29	0.23	0.11	0.02	0.27	0.27	0.05	0.14	0.15	0.41	0.37	0.04
s, saturation flow rate [veh/h]	1119	1567	2813	569	1722	1716	1640	1968	1808	3459	1968	1428
c, Capacity [veh/h]	307	529	950	77	452	451	103	283	260	1383	960	696
d1, Uniform Delay [s]	44.03	45.36	39.65	72.47	59.00	59.00	73.68	68.50	68.50	48.00	33.40	21.89
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]	63.26	6.60	0.97	3.44	51.39	51.83	36.70	55.43	61.86	28.14	5.67	0.24
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	1.04	0.67	0.34	0.13	1.03	1.04	0.73	1.01	1.02	1.02	0.76	0.08
d, Delay for Lane Group [s/veh]	107.30	51.96	40.62	75.91	110.39	110.83	110.38	123.93	130.36	76.14	39.06	22.13
Lane Group LOS	F	D	D	E	F	F	F	F	F	F	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	15.32	13.10	4.95	0.47	24.75	24.72	4.09	15.96	15.13	32.77	24.54	1.27
50th-Percentile Queue Length [m/ln]	116.78	99.81	37.70	3.59	188.60	188.36	31.16	121.64	115.29	249.71	186.97	9.65
95th-Percentile Queue Length [veh/ln]	22.35	19.03	8.60	0.85	33.62	33.61	7.36	22.60	21.75	42.66	32.66	2.28
95th-Percentile Queue Length [m/ln]	170.34	145.04	65.50	6.46	256.17	256.08	56.09	172.22	165.74	325.07	248.87	17.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	107.30	77.65	40.62	75.91	110.61	110.83	110.38	126.83	130.36	76.14	39.06	22.13
Movement LOS	F	E	D	E	F	F	F	F	F	F	D	C
d_A, Approach Delay [s/veh]	66.11			110.24			125.04			62.35		
Approach LOS	E			F			F			E		
d_I, Intersection Delay [s/veh]	80.88											
Intersection LOS	F											
Intersection V/C	0.900											

Emissions

Vehicle Kilometers Traveled [km/h]	99.24	109.53	99.59	3.90	182.17	181.75	11.58	44.01	41.05	331.00	171.98	13.90
Stops [stops/h]	344.81	294.72	222.66	10.59	556.88	556.18	92.01	359.18	340.41	1474.64	552.08	28.49
Fuel consumption [L/h]	43.69	31.21	24.55	1.19	69.57	69.59	9.54	39.46	38.24	146.97	50.71	2.97
CO [g/h]	806.84	576.23	453.24	22.03	1284.73	1284.99	176.19	728.58	706.12	2713.93	936.45	54.80
NOx [g/h]	156.98	112.11	88.18	4.29	249.96	250.01	34.28	141.75	137.39	528.03	182.20	10.66
VOC [g/h]	186.99	133.55	105.04	5.11	297.75	297.81	40.83	168.85	163.65	628.98	217.03	12.70

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]	17.71			16.70			5.94			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			2.777			2.785			3.090		
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]	675			525			288			975		
d_b, Bicycle Delay [s]	35.11			43.51			58.65			21.01		
I_b,int, Bicycle LOS Score for Intersection	2.412			2.339			2.079			5.190		
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):	54.4
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	340	24	1059	89	109	281	85	274	482	73
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	85	6	265	22	27	70	21	69	121	18
Total Analysis Volume [veh/h]	53	696	340	24	1059	89	109	281	85	274	482	73
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	0.21	0.03	0.32	0.06	0.07	0.15	0.05	0.09	0.26	0.05
s, saturation flow rate [veh/h]	720	3279	1589	764	3279	1543	1640	1870	1589	3186	1870	1589
c, Capacity [veh/h]	275	1115	540	352	1115	525	197	411	350	382	411	350
d1, Uniform Delay [s]	21.19	27.65	27.71	17.00	32.17	23.07	41.48	35.80	32.14	42.36	39.00	31.88
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	5.47	0.37	17.30	0.70	10.77	8.88	1.65	10.97	100.24	1.35
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	0.63	0.07	0.95	0.17	0.55	0.68	0.24	0.72	1.17	0.21
d, Delay for Lane Group [s/veh]	22.75	30.29	33.18	17.38	49.47	23.77	52.25	44.68	33.78	53.34	139.24	33.24
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	7.36	0.33	14.50	1.53	3.10	7.21	1.84	3.81	21.34	1.56
50th-Percentile Queue Length [m/ln]	5.94	54.01	56.09	2.52	110.51	11.64	23.63	54.94	14.04	29.01	162.58	11.92
95th-Percentile Queue Length [veh/ln]	1.40	11.45	11.81	0.59	20.75	2.75	5.58	11.61	3.32	6.85	31.45	2.82
95th-Percentile Queue Length [m/ln]	10.70	87.28	89.99	4.53	158.10	20.95	42.53	88.49	25.27	52.22	239.67	21.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.75	30.29	33.18	17.38	49.47	23.77	52.25	44.68	33.78	53.34	139.24	33.24
Movement LOS	C	C	C	B	D	C	D	D	C	D	F	C
d_A, Approach Delay [s/veh]	30.82			46.86			44.46			101.51		
Approach LOS	C			D			D			F		
d_I, Intersection Delay [s/veh]	54.35											
Intersection LOS	D											
Intersection V/C	0.687											

Emissions

Vehicle Kilometers Traveled [km/h]	13.31	174.81	85.40	5.01	221.18	18.59	25.95	66.89	20.23	98.73	173.68	26.30
Stops [stops/h]	28.07	510.33	264.98	11.90	1044.17	54.99	111.62	259.55	66.32	274.11	768.11	56.33
Fuel consumption [L/h]	2.99	47.93	24.68	1.14	93.32	5.02	9.36	21.86	5.62	26.80	85.45	5.64
CO [g/h]	55.27	885.02	455.66	21.08	1723.15	92.75	172.82	403.59	103.86	494.87	1577.83	104.06
NOx [g/h]	10.75	172.19	88.66	4.10	335.26	18.05	33.62	78.52	20.21	96.28	306.99	20.25
VOC [g/h]	12.81	205.11	105.60	4.89	399.36	21.49	40.05	93.54	24.07	114.69	365.68	24.12

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			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	65.94			65.96			66.51			46.35		
d_p, Pedestrian Delay [s]	39.61			39.61			39.61			39.61		
I_p,int, Pedestrian LOS Score for Intersectio	2.929			2.888			2.464			2.623		
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	2.486			2.534			2.358			2.939		
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):	45.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

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	Protecte	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	42	0	0	42	0	27	78	0	0	51	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	4.00	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	2.00	4.00	4.00
g_i, Effective Green Time [s]	37	37	37	37	23	72	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.19	0.60	0.38
(v / s)_i Volume / Saturation Flow Rate	0.11	0.05	0.16	0.09	0.14	0.15	0.36
s, saturation flow rate [veh/h]	1722	1589	1722	1486	1640	1835	1851
c, Capacity [veh/h]	531	490	531	458	314	1101	694
d1, Uniform Delay [s]	32.33	30.11	34.18	31.28	45.83	11.35	36.77
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]	1.92	0.65	3.61	1.56	15.39	0.56	26.96
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	0.15	0.52	0.29	0.75	0.26	0.97
d, Delay for Lane Group [s/veh]	34.25	30.76	37.79	32.85	61.22	11.92	63.73
Lane Group LOS	C	C	D	C	E	B	E
Critical Lane Group	No	No	Yes	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	4.66	1.65	7.15	3.07	8.00	3.65	24.04
50th-Percentile Queue Length [m/ln]	35.49	12.58	54.45	23.41	60.93	27.84	183.20
95th-Percentile Queue Length [veh/ln]	8.20	2.97	11.53	5.53	12.63	6.58	32.08
95th-Percentile Queue Length [m/ln]	62.46	22.64	87.86	42.14	96.27	50.10	244.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	34.25	30.76	0.00	37.79	32.85	61.22	11.92	11.92	0.00	63.73	63.73
Movement LOS		C	C		D	C	E	B	B		E	E
d_A, Approach Delay [s/veh]	33.28			36.20			34.39			63.73		
Approach LOS	C			D			C			E		
d_I, Intersection Delay [s/veh]	45.18											
Intersection LOS	D											
Intersection V/C	0.667											

Emissions

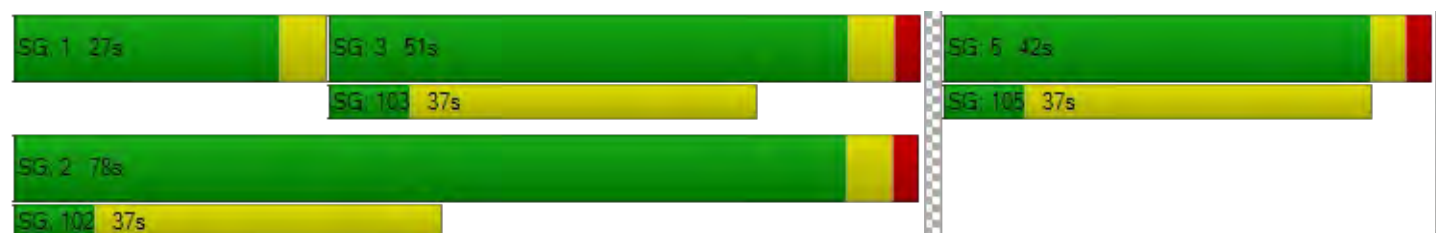
Vehicle Kilometers Traveled [km/h]	39.54	15.16	35.09	16.65	24.78	29.58	388.57
Stops [stops/h]	139.72	49.52	214.38	92.16	239.89	109.59	721.26
Fuel consumption [L/h]	11.99	4.31	16.18	6.97	18.91	7.87	86.09
CO [g/h]	221.36	79.52	298.79	128.64	349.25	145.34	1589.72
NOx [g/h]	43.07	15.47	58.13	25.03	67.95	28.28	309.30
VOC [g/h]	51.30	18.43	69.25	29.81	80.94	33.68	368.43

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	24.18	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	2.273	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]	617	617	1200	750
d_b, Bicycle Delay [s]	28.70	28.70	9.60	23.44
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):	12.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.245

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			Yes			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	66	6	9	35	20	314	15	46	516	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]	9	5	17	2	2	9	5	79	4	12	129	3
Total Analysis Volume [veh/h]	36	18	66	6	9	35	20	314	15	46	516	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	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	0.08	0.03	0.11	0.10	0.17	0.16
s, saturation flow rate [veh/h]	1565	1626	1706	1618	1740	1689
c, Capacity [veh/h]	678	691	806	701	823	732
d1, Uniform Delay [s]	12.28	11.76	10.71	10.75	11.43	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]	0.57	0.20	0.65	0.81	1.21	1.50
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	0.18	0.07	0.22	0.24	0.36	0.38
d, Delay for Lane Group [s/veh]	12.85	11.96	11.35	11.55	12.63	13.04
Lane Group LOS	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.06	0.42	1.46	1.38	2.54	2.48
50th-Percentile Queue Length [m/ln]	8.05	3.18	11.10	10.49	19.38	18.87
95th-Percentile Queue Length [veh/ln]	1.90	0.75	2.62	2.48	4.58	4.46
95th-Percentile Queue Length [m/ln]	14.49	5.73	19.97	18.87	34.89	33.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	12.85	12.85	12.85	11.96	11.96	11.96	11.35	11.45	11.55	12.63	12.84	13.04
Movement LOS	B	B	B	B	B	B	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	12.85			11.96			11.45			12.83		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	12.35											
Intersection LOS	B											
Intersection V/C	0.245											

Emissions

Vehicle Kilometers Traveled [km/h]	11.11	5.36	89.49	82.85	38.45	36.47
Stops [stops/h]	63.38	25.06	87.37	82.56	152.62	148.57
Fuel consumption [L/h]	3.67	1.53	12.06	11.23	9.94	9.60
CO [g/h]	67.70	28.31	222.68	207.35	183.54	177.25
NOx [g/h]	13.17	5.51	43.33	40.34	35.71	34.49
VOC [g/h]	15.69	6.56	51.61	48.05	42.54	41.08

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	13.0	13.0
M_corner, Corner Circulation Area [m²/ped]	26.74	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	63.30	71.18	0.00	125.89
d_p, Pedestrian Delay [s]	21.68	21.68	18.41	18.41
I_p,int, Pedestrian LOS Score for Intersectio	1.871	1.782	2.397	2.359
Crosswalk LOS	A	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]	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	1.769	1.649	1.849	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):	46.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

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	190	38	429	235	54	281	39	73	848	33
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	48	10	107	59	14	70	10	18	212	8
Total Analysis Volume [veh/h]	345	200	190	38	429	235	54	281	39	73	848	33
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	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	2	3	0	2	3	0	4	1	0	4	1	0
Auxiliary Signal Groups												
Maximum Green [s]	10	33	0	10	33	0	10	52	0	10	52	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	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	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	2.0	0.0	1.0	2.0	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]	18	40	0	18	40	0	20	42	0	20	42	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	24	0	7	24	0	7	26	0	7	26	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		Yes	Yes		Yes	Yes	
Maximum Recall	Yes	Yes		Yes	Yes		No	No		No	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	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	3.00	4.00	4.00	3.00	5.00	5.00	3.00	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	2.00	1.00	2.00	2.00	1.00	3.00	3.00	1.00	3.00	3.00
g_i, Effective Green Time [s]	54	36	15	36	36	17	37	37	17	37	37
g / C, Green / Cycle	0.45	0.30	0.13	0.30	0.30	0.14	0.31	0.31	0.14	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.32	0.23	0.02	0.24	0.15	0.03	0.09	0.09	0.04	0.24	0.24
s, saturation flow rate [veh/h]	1062	1692	1595	1810	1536	1709	1795	1708	1638	1840	1808
c, Capacity [veh/h]	401	508	199	543	461	242	553	527	232	567	558
d1, Uniform Delay [s]	27.28	38.20	47.06	38.53	34.60	45.65	31.55	31.63	46.27	37.82	37.87
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
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]	20.81	10.66	2.11	11.16	3.99	2.12	1.34	1.46	3.52	10.28	10.61
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	0.86	0.77	0.19	0.79	0.51	0.22	0.29	0.30	0.31	0.78	0.78
d, Delay for Lane Group [s/veh]	48.09	48.86	49.17	49.69	38.59	47.77	32.90	33.09	49.79	48.10	48.48
Lane Group LOS	D	D	D	D	D	D	C	C	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	8.92	11.84	1.14	13.15	6.15	1.57	3.79	3.71	2.19	13.38	13.26
50th-Percentile Queue Length [m/ln]	67.97	90.23	8.67	100.23	46.89	12.00	28.90	28.30	16.68	101.92	101.05
95th-Percentile Queue Length [veh/ln]	13.82	17.49	2.05	19.10	10.22	2.83	6.83	6.68	3.94	19.37	19.23
95th-Percentile Queue Length [m/ln]	105.29	133.24	15.61	145.56	77.89	21.60	52.02	50.93	30.02	147.63	146.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.09	48.86	48.86	49.17	49.69	38.59	47.77	32.98	33.09	49.79	48.28	48.48
Movement LOS	D	D	D	D	D	D	D	C	C	D	D	D
d_A, Approach Delay [s/veh]	48.50			45.95			35.12			48.40		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	46.01											
Intersection LOS	D											
Intersection V/C	0.657											

Emissions

Vehicle Kilometers Traveled [km/h]	56.43	63.79	5.49	62.00	33.96	13.24	39.76	38.71	6.59	40.02	39.49
Stops [stops/h]	267.60	355.25	34.15	394.62	184.60	47.23	113.79	111.40	65.67	401.27	397.82
Fuel consumption [L/h]	24.15	28.72	2.73	31.17	14.36	4.31	10.44	10.21	4.90	29.24	29.02
CO [g/h]	445.96	530.25	50.37	575.59	265.13	79.52	192.86	188.45	90.47	539.85	535.91
NOx [g/h]	86.77	103.17	9.80	111.99	51.58	15.47	37.52	36.67	17.60	105.03	104.27
VOC [g/h]	103.35	122.89	11.67	133.40	61.45	18.43	44.70	43.68	20.97	125.12	124.20

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]	11.37	11.21	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	2.505	2.440	2.849	2.623
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]	600	600	617	617
d_b, Bicycle Delay [s]	29.40	29.40	28.70	28.70
I_b,int, Bicycle LOS Score for Intersection	2.804	2.758	1.871	2.349
Bicycle LOS	C	C	A	B

Sequence

Ring 1	4	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):	43.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.483

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	113	71	222	70	78	310	66	85	329	11
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	28	18	56	18	20	78	17	21	82	3
Total Analysis Volume [veh/h]	93	166	113	71	222	70	78	310	66	85	329	11
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	28	0	14	28	0	10	40	0	10	40	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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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	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]	14	28	14	28	58	40	58	40
g / C, Green / Cycle	0.12	0.23	0.12	0.23	0.48	0.33	0.48	0.33
(v / s)_i Volume / Saturation Flow Rate	0.06	0.16	0.04	0.17	0.06	0.23	0.07	0.20
s, saturation flow rate [veh/h]	1640	1704	1640	1768	1206	1650	1181	1708
c, Capacity [veh/h]	191	398	191	413	498	550	460	569
d1, Uniform Delay [s]	49.63	42.17	48.93	42.24	18.60	34.54	19.43	33.29
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	9.91	5.44	9.83	0.67	6.76	0.88	4.57
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	0.70	0.37	0.71	0.16	0.68	0.18	0.60
d, Delay for Lane Group [s/veh]	58.20	52.08	54.38	52.07	19.27	41.30	20.31	37.86
Lane Group LOS	E	D	D	D	B	D	C	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	3.07	8.64	2.26	9.04	1.26	10.43	1.39	8.91
50th-Percentile Queue Length [m/ln]	23.39	65.86	17.20	68.88	9.62	79.45	10.62	67.90
95th-Percentile Queue Length [veh/ln]	5.53	13.46	4.06	13.97	2.27	15.72	2.51	13.81
95th-Percentile Queue Length [m/ln]	42.10	102.59	30.96	106.45	17.32	119.80	19.12	105.20

Movement, Approach, & Intersection Results												
d_M, Delay for Movement [s/veh]	58.20	52.08	52.08	54.38	52.07	52.07	19.27	41.30	41.30	20.31	37.86	37.86
Movement LOS	E	D	D	D	D	D	B	D	D	C	D	D
d_A, Approach Delay [s/veh]	53.61			52.52			37.51			34.35		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	43.77											
Intersection LOS	D											
Intersection V/C	0.483											

Emissions								
Vehicle Kilometers Traveled [km/h]	23.50	70.51	24.07	99.00	22.31	107.57	29.23	116.91
Stops [stops/h]	92.09	259.27	67.71	271.18	37.89	312.80	41.82	267.32
Fuel consumption [L/h]	8.47	23.72	6.78	27.22	4.13	29.21	5.05	27.04
CO [g/h]	156.43	437.96	125.25	502.54	76.27	539.42	93.24	499.22
NOx [g/h]	30.43	85.21	24.37	97.78	14.84	104.95	18.14	97.13
VOC [g/h]	36.25	101.50	29.03	116.47	17.68	125.02	21.61	115.70

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]	25.49	28.68	23.46	20.20
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.269	2.213	2.397	2.381
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]	467	467	667	667
d_b, Bicycle Delay [s]	35.27	35.27	26.67	26.67
I_b,int, Bicycle LOS Score for Intersection	2.192	2.170	2.320	2.263
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):	115.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.834

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]	11	44	9	11	44	0	9	48	0	17	56	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	L	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	7.00	4.00	6.00	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
l2, Clearance Lost Time [s]	4.00	5.00	0.00	4.00	5.00	5.00	0.00	5.00	0.00	5.00
g_i, Effective Green Time [s]	5	37	49	5	37	37	58	41	58	49
g / C, Green / Cycle	0.04	0.31	0.41	0.04	0.31	0.31	0.48	0.34	0.48	0.41
(v / s)_i Volume / Saturation Flow Rate	0.04	0.11	0.20	0.01	0.09	0.10	0.06	0.47	0.45	0.24
s, saturation flow rate [veh/h]	1640	3560	1519	1640	1722	1535	1054	1686	969	1843
c, Capacity [veh/h]	68	1098	619	68	531	473	425	576	324	753
d1, Uniform Delay [s]	57.27	32.28	25.83	55.85	31.54	31.77	18.77	39.50	41.76	27.47
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]	84.87	0.91	2.65	12.03	1.39	1.72	0.78	178.81	174.01	3.20
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
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	0.91	0.36	0.48	0.32	0.29	0.31	0.16	1.37	1.34	0.58
d, Delay for Lane Group [s/veh]	142.14	33.19	28.48	67.88	32.93	33.49	19.55	218.31	215.77	30.67
Lane Group LOS	F	C	C	E	C	C	B	F	F	C
Critical Lane Group	Yes	No	Yes	No	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	3.48	4.60	6.59	0.88	3.63	3.53	1.07	45.24	21.30	10.20
50th-Percentile Queue Length [m/ln]	26.52	35.03	50.20	6.67	27.66	26.86	8.16	344.74	162.31	77.72
95th-Percentile Queue Length [veh/ln]	6.27	8.11	10.80	1.58	6.53	6.35	1.93	67.55	34.50	15.44
95th-Percentile Queue Length [m/ln]	47.74	61.82	82.28	12.01	49.79	48.35	14.69	514.76	262.88	117.64

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	142.14	33.19	28.48	67.88	33.12	33.49	19.55	218.31	218.31	215.77	30.67	30.67
Movement LOS	F	C	C	E	C	C	B	F	F	F	C	C
d_A, Approach Delay [s/veh]	40.30			35.55			203.00			123.33		
Approach LOS	D			D			F			F		
d_I, Intersection Delay [s/veh]	115.21											
Intersection LOS	F											
Intersection V/C	0.834											

Emissions

Vehicle Kilometers Traveled [km/h]	11.11	70.61	53.23	4.98	35.06	33.52	25.38	304.20	119.17	118.90
Stops [stops/h]	104.42	275.82	197.65	26.26	108.89	105.76	32.13	1357.23	639.03	306.00
Fuel consumption [L/h]	10.19	22.98	16.01	2.21	9.71	9.38	4.13	192.38	97.96	28.43
CO [g/h]	188.12	424.32	295.71	40.87	179.24	173.27	76.26	3552.50	1808.92	525.00
NOx [g/h]	36.60	82.56	57.53	7.95	34.87	33.71	14.84	691.19	351.95	102.15
VOC [g/h]	43.60	98.34	68.53	9.47	41.54	40.16	17.67	823.33	419.23	121.67

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]	6.11			16.66			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	3.082			2.531			2.563			2.572		
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]	617			617			683			817		
d_b, Bicycle Delay [s]	28.70			28.70			26.00			21.00		
I_b,int, Bicycle LOS Score for Intersection	2.208			1.834			3.036			2.998		
Bicycle LOS	B			A			C			C		

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):	89.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.021

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	169	239	1769	76	115	595	342	204	556	156
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	42	60	442	19	29	149	86	51	139	39
Total Analysis Volume [veh/h]	205	899	169	239	1769	76	115	595	342	204	556	156
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	5.0	0.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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	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]	10	56	0	10	56	0	9	35	0	9	35	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	26	0	7	26	0	6	25	0	6	25	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	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	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]	61	51	51	61	51	51	39	30	30	37	30	30
g / C, Green / Cycle	0.55	0.46	0.46	0.55	0.46	0.46	0.35	0.27	0.27	0.34	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.53	0.33	0.34	0.38	0.55	0.56	0.14	0.29	0.34	0.29	0.23	0.26
s, saturation flow rate [veh/h]	390	1683	1540	623	1683	1639	832	1683	1324	710	1616	1313
c, Capacity [veh/h]	209	780	714	310	780	760	219	459	361	192	441	358
d1, Uniform Delay [s]	39.64	23.45	23.90	22.46	29.50	29.50	28.97	40.00	40.00	45.58	37.73	39.36
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.19	0.27	0.18	0.11	0.14
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]	57.16	5.22	6.44	16.79	94.90	108.32	8.69	44.96	120.95	57.80	4.35	16.68
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	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	0.98	0.70	0.73	0.77	1.18	1.21	0.52	1.06	1.24	1.06	0.84	0.96
d, Delay for Lane Group [s/veh]	96.79	28.67	30.34	39.25	124.39	137.82	37.66	84.96	160.96	103.37	42.07	56.04
Lane Group LOS	F	C	C	D	F	F	D	F	F	F	D	E
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	5.85	12.05	11.86	4.45	40.15	41.92	2.61	17.90	21.71	6.69	9.91	10.72
50th-Percentile Queue Length [m/ln]	44.56	91.83	90.35	33.87	305.93	319.46	19.89	136.42	165.43	50.97	75.55	81.69
95th-Percentile Queue Length [veh/ln]	9.81	17.74	17.50	7.90	56.97	60.20	4.70	25.80	33.01	11.32	15.08	16.09
95th-Percentile Queue Length [m/ln]	74.78	135.21	133.39	60.22	434.08	458.72	35.80	196.61	251.54	86.22	114.90	122.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	96.79	29.32	30.34	39.25	130.82	137.82	37.66	98.54	160.96	103.37	46.75	56.04
Movement LOS	F	C	C	D	F	F	D	F	F	F	D	E
d_A, Approach Delay [s/veh]	40.32			120.57			112.18			60.94		
Approach LOS	D			F			F			E		
d_I, Intersection Delay [s/veh]	89.47											
Intersection LOS	F											
Intersection V/C	1.021											

Emissions

Vehicle Kilometers Traveled [km/h]	64.03	171.01	162.58	26.36	101.73	101.73	66.35	281.97	258.66	34.50	62.52	57.88
Stops [stops/h]	191.39	394.38	388.06	145.48	1313.95	1372.04	85.41	585.93	710.50	218.93	324.48	350.85
Fuel consumption [L/h]	25.67	37.21	36.34	13.00	127.54	138.38	11.57	71.95	96.12	23.04	23.27	25.95
CO [g/h]	473.98	687.08	671.01	239.97	2355.03	2555.20	213.56	1328.65	1774.95	425.50	429.69	479.15
NOx [g/h]	92.22	133.68	130.56	46.69	458.20	497.15	41.55	258.51	345.34	82.79	83.60	93.23
VOC [g/h]	109.85	159.24	155.51	55.62	545.80	592.19	49.49	307.93	411.36	98.61	99.58	111.05

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]	4.80			5.57			6.85			6.65		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.162			3.030			2.888			2.811		
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]	836			836			455			455		
d_b, Bicycle Delay [s]	18.68			18.78			32.96			33.04		
I_b,int, Bicycle LOS Score for Intersection	2.624			3.286			2.456			2.329		
Bicycle LOS	B			C			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):	10.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

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	0.40
s, saturation flow rate [veh/h]	3204	1410	3204
c, Capacity [veh/h]	2207	971	2207
d1, Uniform Delay [s]	7.28	5.43	8.83
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	1.10
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	0.58
d, Delay for Lane Group [s/veh]	7.80	5.49	9.93
Lane Group LOS	A	A	A
Critical Lane Group	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.01	0.22	7.25
50th-Percentile Queue Length [m/ln]	30.59	1.65	55.28
95th-Percentile Queue Length [veh/ln]	7.22	0.39	11.67
95th-Percentile Queue Length [m/ln]	55.05	2.97	88.94

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	9.93	0.00	0.00
Movement LOS			A		A			A		
d_A, Approach Delay [s/veh]	7.72					9.93				
Approach LOS	A					A				
d_I, Intersection Delay [s/veh]	10.35									
Intersection LOS	B									
Intersection V/C	0.444									

Emissions

Vehicle Kilometers Traveled [km/h]	94.84	3.31	402.16
Stops [stops/h]	262.73	7.09	474.86
Fuel consumption [L/h]	20.08	0.60	58.65
CO [g/h]	370.86	11.10	1083.00
NOx [g/h]	72.16	2.16	210.71
VOC [g/h]	85.95	2.57	251.00

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	2.777	2.679
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	2.609
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]	10.35									
Intersection LOS	B									
Intersection V/C	0.444									

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 [m ² /ped]	0.00	0.00
M_CW, Crosswalk Circulation Area [m ² /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]	10.35									
Intersection LOS	B									
Intersection V/C	0.444									

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): 15.4
Level Of Service: C
Volume to Capacity (v/c): 0.094

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	Yes			Yes			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	0	0	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	0	0	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	0	0	9
Total Analysis Volume [veh/h]	0	1129	40	54	2032	51	0	0	0	0	0	36
Pedestrian Volume [ped/h]	0			0			65			82		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				
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	0.00	0.00	0.09
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	0.00	0.00	15.41
Movement LOS		A	A	B	A	A						C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.31
95th-Percentile Queue Length [m/ln]	0.00	0.00	0.00	0.71	0.35	0.00	0.00	0.00	0.00	0.00	0.00	2.36
d_A, Approach Delay [s/veh]	0.00			0.31			0.00			15.41		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	0.36											
Intersection LOS	C											

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

Control Type:	Signalized	Delay (sec / veh):	188.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.073

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				Yes				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]	220
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												
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]	48	98	0	44	0	0	98	0	0	0	44	48
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	5	24	0	20	0	0	24	0	0	0	20	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	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	23

Lane Group Calculations

Lane Group	L	C	R	C	C	L	C	R
C, Calculated Cycle Length [s]	220	220	220	220	220	220	220	220
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]	141	141	167	93	93	39	39	39
g / C, Green / Cycle	0.64	0.64	0.76	0.42	0.42	0.18	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.62	0.25	0.01	0.59	0.59	0.27	0.28	0.16
s, saturation flow rate [veh/h]	568	3204	1419	1683	1690	1086	1114	1397
c, Capacity [veh/h]	382	2054	1078	711	714	215	227	248
d1, Uniform Delay [s]	79.86	18.95	6.42	63.50	63.50	94.31	93.87	87.92
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.36
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	28.90	0.56	0.01	188.45	186.02	179.59	202.22	26.47
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	0.92	0.39	0.01	1.40	1.39	1.34	1.39	0.88
d, Delay for Lane Group [s/veh]	108.76	19.52	6.43	251.95	249.52	273.90	296.08	114.38
Lane Group LOS	F	B	A	F	F	F	F	F
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	11.58	10.40	0.10	77.10	76.93	23.28	25.91	14.06
50th-Percentile Queue Length [m/ln]	88.26	79.23	0.75	587.53	586.18	177.41	197.42	107.17
95th-Percentile Queue Length [veh/ln]	17.16	15.69	0.18	113.10	112.66	35.55	39.65	20.21
95th-Percentile Queue Length [m/ln]	130.80	119.53	1.35	861.79	858.45	270.92	302.15	154.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	108.76	19.52	0.00	6.43	0.00	0.00	250.84	249.52	284.00	0.00	296.08	114.38
Movement LOS	F	B		A			F	F	F		F	F
d_A, Approach Delay [s/veh]	46.26				250.73				239.97			
Approach LOS	D				F				F			
d_I, Intersection Delay [s/veh]	188.93											
Intersection LOS	F											
Intersection V/C	1.073											

Emissions

Vehicle Kilometers Traveled [km/h]	36.98	85.15	0.85	103.13	103.13	56.85	62.36	43.22
Stops [stops/h]	189.54	340.29	1.61	1261.70	1258.79	380.99	423.94	230.13
Fuel consumption [L/h]	37.09	27.85	0.16	231.37	229.45	74.71	87.49	28.57
CO [g/h]	684.82	514.29	2.88	4272.45	4236.92	1379.65	1615.58	527.51
NOx [g/h]	133.24	100.06	0.56	831.26	824.35	268.43	314.33	102.64
VOC [g/h]	158.71	119.19	0.67	990.18	981.95	319.75	374.43	122.26

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0				11.0				11.0			
M_corner, Corner Circulation Area [m²/ped]	5.17				51.50				0.00			
M_CW, Crosswalk Circulation Area [m²/ped]	0.70				0.00				0.63			
d_p, Pedestrian Delay [s]	99.28				99.28				99.28			
I_p,int, Pedestrian LOS Score for Intersectio	3.136				2.797				2.600			
Crosswalk LOS	C				C				B			
s_b, Saturation Flow Rate of the bicycle lane	2000				2000				2000			
c_b, Capacity of the bicycle lane [bicycles/h]	1282				845				355			
d_b, Bicycle Delay [s]	14.32				37.12				74.79			
I_b,int, Bicycle LOS Score for Intersection	2.521				3.218				2.957			
Bicycle LOS	B				C				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				Yes			

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]	220
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								
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]	44	0	0	0	0	0	0	0
Lead / Lag	Lag	-	-	-	-	-	-	-
Minimum Green [s]	20	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	4
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	23

Lane Group Calculations

Lane Group	L	R	
C, Calculated Cycle Length [s]	220	220	
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]	39	39	
g / C, Green / Cycle	0.18	0.18	
(v / s)_i Volume / Saturation Flow Rate	0.06	0.12	
s, saturation flow rate [veh/h]	979	1431	
c, Capacity [veh/h]	33	254	
d1, Uniform Delay [s]	110.00	84.97	
k, delay calibration	0.11	0.22	
l, Upstream Filtering Factor	1.00	1.00	
d2, Incremental Delay [s]	386.21	6.99	
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	1.80	0.70	
d, Delay for Lane Group [s/veh]	496.21	91.96	
Lane Group LOS	F	F	
Critical Lane Group	No	No	
50th-Percentile Queue Length [veh/ln]	5.43	10.17	
50th-Percentile Queue Length [m/ln]	41.40	77.49	
95th-Percentile Queue Length [veh/ln]	9.78	15.40	
95th-Percentile Queue Length [m/ln]	74.52	117.34	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	496.21	0.00	0.00	91.96	0.00	0.00	0.00	0.00
Movement LOS	F			F				
d_A, Approach Delay [s/veh]	193.03				0.00			
Approach LOS	F				A			
d_I, Intersection Delay [s/veh]	188.93							
Intersection LOS	F							
Intersection V/C	1.073							

Emissions

Vehicle Kilometers Traveled [km/h]	2.14	6.43	
Stops [stops/h]	88.91	166.41	
Fuel consumption [L/h]	23.52	14.65	
CO [g/h]	434.33	270.51	
NOx [g/h]	84.50	52.63	
VOC [g/h]	100.66	62.69	

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]	6.74	0.00
d_p, Pedestrian Delay [s]	99.28	99.28
I_p,int, Pedestrian LOS Score for Intersectio	2.078	3.308
Crosswalk LOS	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	355	0
d_b, Bicycle Delay [s]	74.46	110.00
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132
Bicycle LOS	A	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
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):	35.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

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	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.00	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					
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	8.0	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	15	15	0	0	76	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]		29	70	
g / C, Green / Cycle		0.26	0.64	
(v / s)_i Volume / Saturation Flow Rate		0.18	0.62	
s, saturation flow rate [veh/h]		2858	2493	
c, Capacity [veh/h]		746	1593	
d1, Uniform Delay [s]		36.45	18.22	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		4.85	15.46	
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		0.68	0.96	
d, Delay for Lane Group [s/veh]		41.31	33.68	
Lane Group LOS		D	C	
Critical Lane Group		Yes	Yes	
50th-Percentile Queue Length [veh/ln]		6.52	19.19	
50th-Percentile Queue Length [m/ln]		49.66	146.22	
95th-Percentile Queue Length [veh/ln]		10.70	26.37	
95th-Percentile Queue Length [m/ln]		81.56	200.96	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	41.31	41.31	0.00	0.00	33.68	33.68	0.00	0.00	0.00
Movement LOS				D	D			F	C			
d_A, Approach Delay [s/veh]	0.00			41.31			33.68			0.00		
Approach LOS	A			D			C			A		
d_I, Intersection Delay [s/veh]	35.56											
Intersection LOS	D											
Intersection V/C	0.635											

Emissions

Vehicle Kilometers Traveled [km/h]		90.53	82.68	
Stops [stops/h]		426.57	1255.97	
Fuel consumption [L/h]		34.22	75.86	
CO [g/h]		631.86	1400.83	
NOx [g/h]		122.94	272.55	
VOC [g/h]		146.44	324.66	

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	2.794	2.394
Crosswalk LOS	B	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	527	1127	0
d_b, Bicycle Delay [s]	55.00	29.93	10.53	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 SB

Control Type:	Signalized	Delay (sec / veh):	15.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.580

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]		83	83	
g / C, Green / Cycle		0.76	0.76	
(v / s)_i Volume / Saturation Flow Rate		0.62	0.63	
s, saturation flow rate [veh/h]		1683	1657	
c, Capacity [veh/h]		1274	1254	
d1, Uniform Delay [s]		8.60	8.83	
k, delay calibration		0.50	0.50	
l, Upstream Filtering Factor		1.00	1.00	
d2, Incremental Delay [s]		6.04	6.64	
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		0.82	0.83	
d, Delay for Lane Group [s/veh]		14.65	15.47	
Lane Group LOS		B	B	
Critical Lane Group		No	Yes	
50th-Percentile Queue Length [veh/ln]		14.55	15.06	
50th-Percentile Queue Length [m/ln]		110.87	114.73	
95th-Percentile Queue Length [veh/ln]		20.80	21.42	
95th-Percentile Queue Length [m/ln]		158.53	163.22	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	15.04	15.47	0.00	0.00
Movement LOS			B	B		
d_A, Approach Delay [s/veh]	0.00		15.06		0.00	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	15.06					
Intersection LOS	B					
Intersection V/C	0.580					

Emissions

Vehicle Kilometers Traveled [km/h]		361.90	361.90	
Stops [stops/h]		476.16	492.74	
Fuel consumption [L/h]		56.92	57.96	
CO [g/h]		1051.01	1070.19	
NOx [g/h]		204.49	208.22	
VOC [g/h]		243.58	248.03	

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	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	2.739	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	1364	0
d_b, Bicycle Delay [s]	55.00	5.58	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):	55.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
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			Yes			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	33	17	206	648	289	217	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]	156	79	34	0	181	8	4	52	162	72	54	4
Total Analysis Volume [veh/h]	624	314	134	0	722	33	17	206	648	289	217	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	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]	38	33	0	0	33	38	10	38	38	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	24	0	0	24	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]	44	39	0	0	39	44	17	36	44	23	42	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]	151	151	151	151	151	151	151	151	151	151	151
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]	38	77	33	33	77	4	38	82	16	50	50
g / C, Green / Cycle	0.25	0.51	0.22	0.22	0.51	0.02	0.25	0.54	0.10	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.26	0.10	0.09	0.23	0.03	0.01	0.07	0.28	0.09	0.08	0.08
s, saturation flow rate [veh/h]	2404	3204	1431	3204	1318	1535	2951	2325	3113	1550	1512
c, Capacity [veh/h]	622	1636	313	701	673	37	744	1264	327	516	503
d1, Uniform Delay [s]	58.80	20.03	50.78	58.91	18.53	72.65	45.37	21.75	66.60	36.31	36.33
k, delay calibration	0.11	0.11	0.11	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]	17.70	0.06	0.93	24.09	0.03	8.76	0.92	0.32	7.92	1.03	1.06
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	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	1.00	0.19	0.43	1.03	0.05	0.46	0.28	0.51	0.88	0.23	0.23
d, Delay for Lane Group [s/veh]	76.50	20.09	51.71	83.01	18.56	81.41	46.29	22.07	74.52	37.34	37.39
Lane Group LOS	F	C	D	F	B	F	D	C	E	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	13.64	3.07	4.49	15.72	0.60	0.74	3.24	7.32	5.87	3.33	3.27
50th-Percentile Queue Length [m/ln]	103.93	23.41	34.19	119.76	4.58	5.66	24.70	55.78	44.70	25.37	24.94
95th-Percentile Queue Length [veh/ln]	19.74	5.53	7.96	22.59	1.08	1.34	5.83	11.76	9.84	5.99	5.89
95th-Percentile Queue Length [m/ln]	150.42	42.14	60.65	172.15	8.24	10.18	44.46	89.59	74.96	45.67	44.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	76.50	20.09	51.71	0.00	83.01	18.56	81.41	46.29	22.07	74.52	37.36	37.39
Movement LOS	F	C	D		F	B	F	D	C	E	D	D
d_A, Approach Delay [s/veh]	56.88			80.19			28.96			57.94		
Approach LOS	E			F			C			E		
d_I, Intersection Delay [s/veh]	54.96											
Intersection LOS	D											
Intersection V/C	0.652											

Emissions

Vehicle Kilometers Traveled [km/h]	176.63	88.88	37.93	166.89	7.63	5.59	67.73	213.06	47.95	19.51	19.14
Stops [stops/h]	651.05	146.65	107.08	750.26	14.33	17.71	154.72	349.41	280.00	79.48	78.11
Fuel consumption [L/h]	68.18	16.61	11.35	78.87	1.52	2.00	17.26	39.13	27.43	7.02	6.90
CO [g/h]	1258.95	306.63	209.54	1456.34	28.05	36.84	318.73	722.51	506.52	129.66	127.35
NOx [g/h]	244.95	59.66	40.77	283.35	5.46	7.17	62.01	140.57	98.55	25.23	24.78
VOC [g/h]	291.77	71.06	48.56	337.52	6.50	8.54	73.87	167.45	117.39	30.05	29.52

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			11.0			13.0			13.0		
M_corner, Corner Circulation Area [m²/ped]	25.12			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	0.00			245.97			0.00			34.85		
d_p, Pedestrian Delay [s]	64.82			64.82			62.98			62.98		
I_p,int, Pedestrian LOS Score for Intersectio	2.966			2.552			3.757			2.627		
Crosswalk LOS	C			B			D			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1021			438			385			464		
d_b, Bicycle Delay [s]	18.07			46.03			49.20			44.48		
I_b,int, Bicycle LOS Score for Intersection	2.456			2.185			2.278			1.992		
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):	131.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.833

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	154	60	84	54	48	948	349	85	832	38
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	39	15	21	14	12	237	87	21	208	10
Total Analysis Volume [veh/h]	309	82	154	60	84	54	48	948	349	85	832	38
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	Protecte	Overlap	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	2	3	3	2	3	0	4	1	0	5	6	0
Auxiliary Signal Groups		2,3	2,3									
Maximum Green [s]	25	19	19	25	19	0	10	43	0	10	43	0
Amber [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
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	5.0	5.0	0.0	5.0	0.0	0.0	5.0	0.0	0.0	5.0	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]	1.0	3.0	3.0	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	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]	19	29	29	19	29	0	10	52	0	12	50	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	7	10	0	7	15	0	7	15	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	Yes		No	Yes	
Maximum Recall	Yes	Yes	Yes	Yes	Yes		No	No		Yes	No	
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	C	L	C	C	L	C	R	L	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	3.00	5.00	5.00	3.00	5.00	5.00	3.00	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
l2, Clearance Lost Time [s]	1.00	0.00	0.00	1.00	3.00	3.00	1.00	3.00	3.00	0.00	3.00
g_i, Effective Green Time [s]	16	43	43	16	24	24	5	49	49	9	45
g / C, Green / Cycle	0.15	0.39	0.39	0.15	0.22	0.22	0.05	0.44	0.44	0.08	0.41
(v / s)_i Volume / Saturation Flow Rate	0.19	0.05	0.12	0.06	0.04	0.05	0.03	0.56	0.27	0.07	0.53
s, saturation flow rate [veh/h]	1667	1683	1249	1071	1750	1226	1603	1683	1310	1257	1651
c, Capacity [veh/h]	242	658	488	112	382	267	80	742	578	189	675
d1, Uniform Delay [s]	47.00	21.45	23.27	53.12	35.03	35.57	51.18	30.74	22.73	48.96	32.50
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	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	1.00
d2, Incremental Delay [s]	151.57	0.39	1.69	16.99	1.07	2.25	7.04	135.05	4.63	7.54	140.60
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	1.27	0.12	0.32	0.53	0.19	0.25	0.60	1.28	0.60	0.45	1.29
d, Delay for Lane Group [s/veh]	198.57	21.84	24.96	70.11	36.10	37.81	58.22	165.80	27.36	56.51	173.10
Lane Group LOS	F	C	C	E	D	D	E	F	C	E	F
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	16.79	1.42	2.98	2.19	1.66	1.66	1.45	46.61	7.27	2.65	43.67
50th-Percentile Queue Length [m/ln]	127.90	10.84	22.73	16.67	12.64	12.63	11.04	355.19	55.38	20.20	332.74
95th-Percentile Queue Length [veh/ln]	26.04	2.56	5.37	3.94	2.98	2.98	2.61	68.04	11.69	4.77	64.12
95th-Percentile Queue Length [m/ln]	198.42	19.51	40.91	30.01	22.75	22.74	19.87	518.49	89.07	36.36	488.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	198.57	21.84	24.96	70.11	36.37	37.81	58.22	165.80	27.36	56.51	173.10	173.10
Movement LOS	F	C	C	E	D	D	E	F	C	E	F	F
d_A, Approach Delay [s/veh]	122.92			46.99			126.04			162.73		
Approach LOS	F			D			F			F		
d_I, Intersection Delay [s/veh]	131.85											
Intersection LOS	F											
Intersection V/C	0.833											

Emissions

Vehicle Kilometers Traveled [km/h]	146.52	38.88	73.02	11.94	14.08	13.39	12.93	255.37	94.01	39.19	401.13
Stops [stops/h]	549.33	46.56	97.62	71.60	54.27	54.27	47.40	1525.52	237.85	86.77	1429.11
Fuel consumption [L/h]	73.52	6.12	12.10	5.98	4.52	4.45	4.45	179.57	21.64	9.37	186.21
CO [g/h]	1357.59	113.07	223.41	110.47	83.55	82.18	82.10	3315.91	399.53	173.11	3438.56
NOx [g/h]	264.14	22.00	43.47	21.49	16.26	15.99	15.97	645.16	77.73	33.68	669.02
VOC [g/h]	314.64	26.21	51.78	25.60	19.36	19.05	19.03	768.49	92.60	40.12	796.92

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			66.58			0.00			0.00		
M_CW, Crosswalk Circulation Area [m²/ped]	4.06			3.10			6.96			4.87		
d_p, Pedestrian Delay [s]	44.55			44.55			44.55			44.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.558			2.392			2.880			2.771		
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]	782			345			764			727		
d_b, Bicycle Delay [s]	20.40			37.64			21.02			22.27		
I_b,int, Bicycle LOS Score for Intersection	2.022			1.727			3.837			3.142		
Bicycle LOS	B			A			D			C		

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):	40.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

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	19	837	0	148	69	286	0	0	364	420
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	5	209	0	37	17	72	0	0	91	105
Total Analysis Volume [veh/h]	0	42	19	837	0	148	69	286	0	0	364	420
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	54	0	54	0	0	17	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]	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]	49	49	49	6	40	40	40
g / C, Green / Cycle	0.45	0.45	0.45	0.06	0.36	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.04	0.40	0.11	0.04	0.09	0.22	0.31
s, saturation flow rate [veh/h]	1613	2111	1379	1603	3204	1683	1345
c, Capacity [veh/h]	719	917	614	92	1156	607	485
d1, Uniform Delay [s]	17.58	32.46	18.87	51.05	24.69	28.69	32.70
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]	0.23	14.94	0.93	11.36	0.51	4.34	18.39
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	0.08	0.91	0.24	0.75	0.25	0.60	0.87
d, Delay for Lane Group [s/veh]	17.81	47.40	19.79	62.40	25.20	33.03	51.08
Lane Group LOS	B	D	B	E	C	C	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.93	12.51	2.47	2.16	2.69	8.43	12.60
50th-Percentile Queue Length [m/ln]	7.12	95.36	18.83	16.44	20.46	64.25	96.03
95th-Percentile Queue Length [veh/ln]	1.68	18.32	4.45	3.88	4.83	13.19	18.42
95th-Percentile Queue Length [m/ln]	12.82	139.57	33.90	29.60	36.83	100.54	140.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	17.81	17.81	47.40	0.00	19.79	62.40	25.20	0.00	0.00	33.03	51.08
Movement LOS		B	B	D		B	E	C			C	D
d_A, Approach Delay [s/veh]	17.81			43.26			32.43			42.70		
Approach LOS	B			D			C			D		
d_I, Intersection Delay [s/veh]	40.59											
Intersection LOS	D											
Intersection V/C	0.752											

Emissions

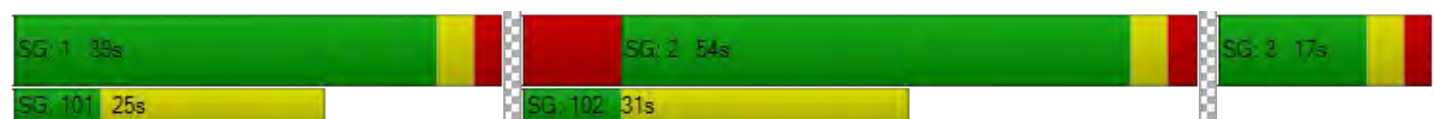
Vehicle Kilometers Traveled [km/h]	6.01	183.51	32.45	19.71	81.69	210.02	242.33
Stops [stops/h]	30.59	819.13	80.88	70.62	175.76	275.95	412.44
Fuel consumption [L/h]	2.10	66.40	7.16	6.78	17.27	35.43	48.83
CO [g/h]	38.69	1226.06	132.18	125.12	318.84	654.31	901.75
NOx [g/h]	7.53	238.55	25.72	24.34	62.04	127.30	175.45
VOC [g/h]	8.97	284.15	30.63	29.00	73.90	151.64	208.99

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	3.80	20.61	0.00
d_p, Pedestrian Delay [s]	44.55	44.55	43.65	43.65
I_p,int, Pedestrian LOS Score for Intersectio	1.499	2.648	2.487	3.887
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]	745	745	618	618
d_b, Bicycle Delay [s]	21.64	21.64	26.25	26.25
I_b,int, Bicycle LOS Score for Intersection	1.664	1.560	1.852	2.241
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 [m ² /ped]	0.00	45.81
M_CW, Crosswalk Circulation Area [m ² /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

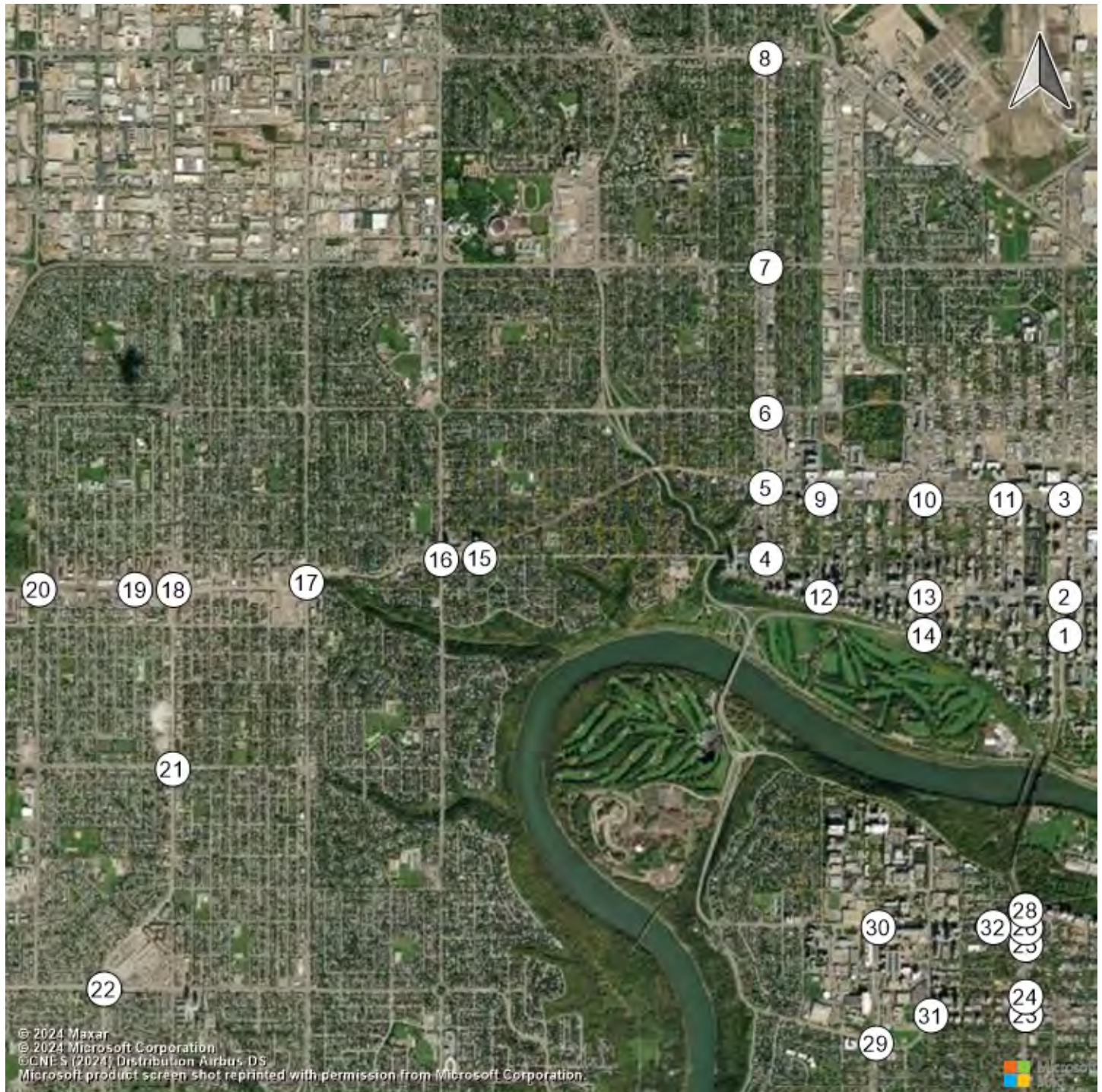
g_Walk,mi, Effective Walk Time [s]	11.0	11.0
M_corner, Corner Circulation Area [m²/ped]	45.21	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	23.95	0.00
d_p, Pedestrian Delay [s]	44.55	44.55
I_p,int, Pedestrian LOS Score for Intersectio	1.762	1.901
Crosswalk LOS	A	A
s_b, Saturation Flow Rate of the bicycle 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

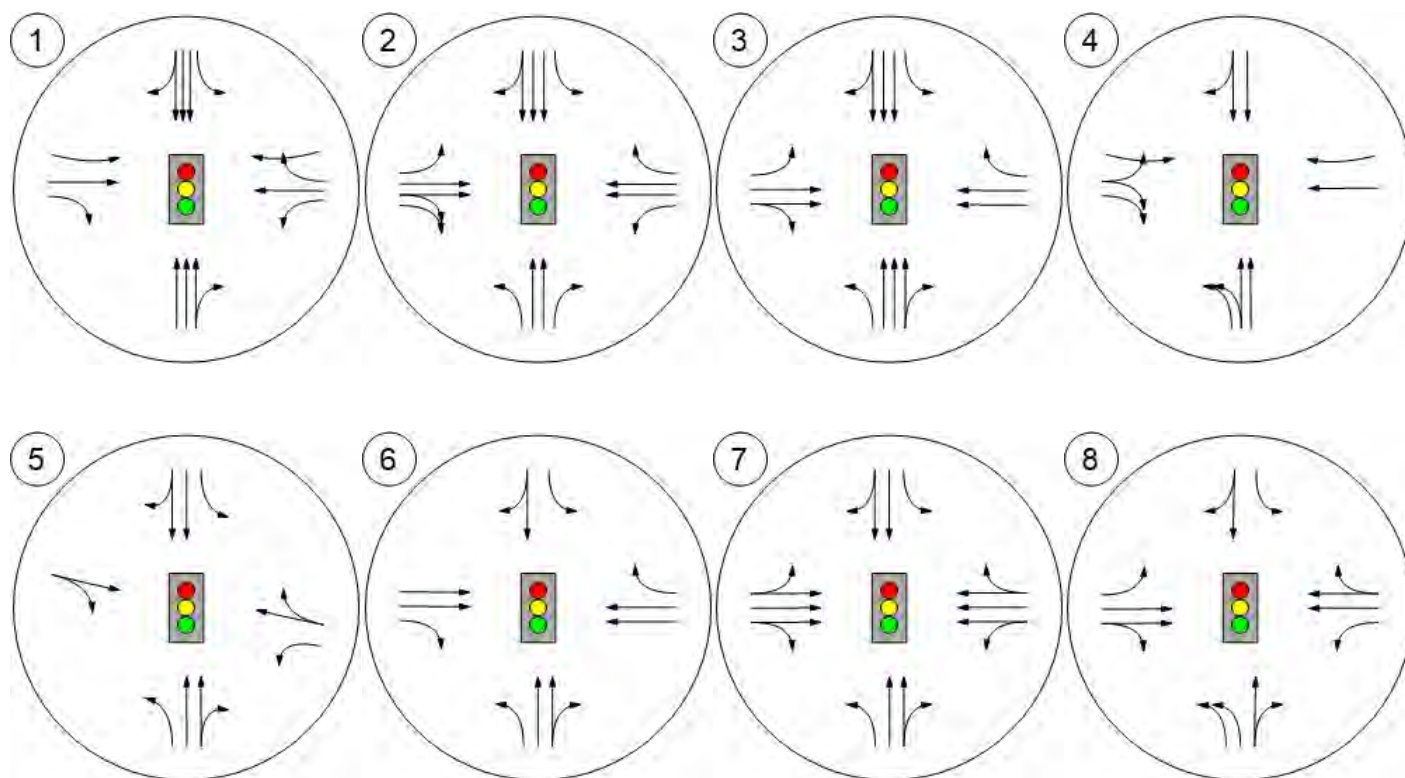
Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



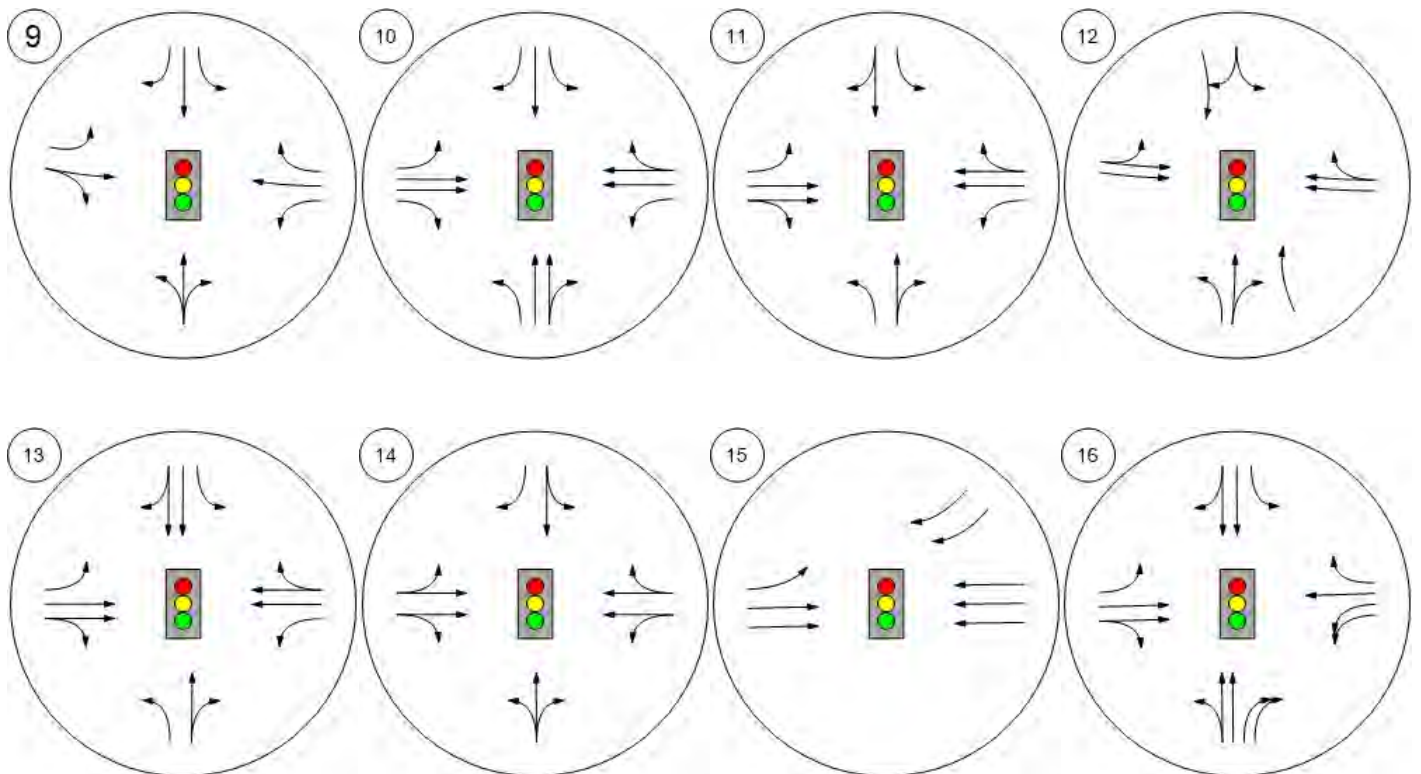
Study Intersections



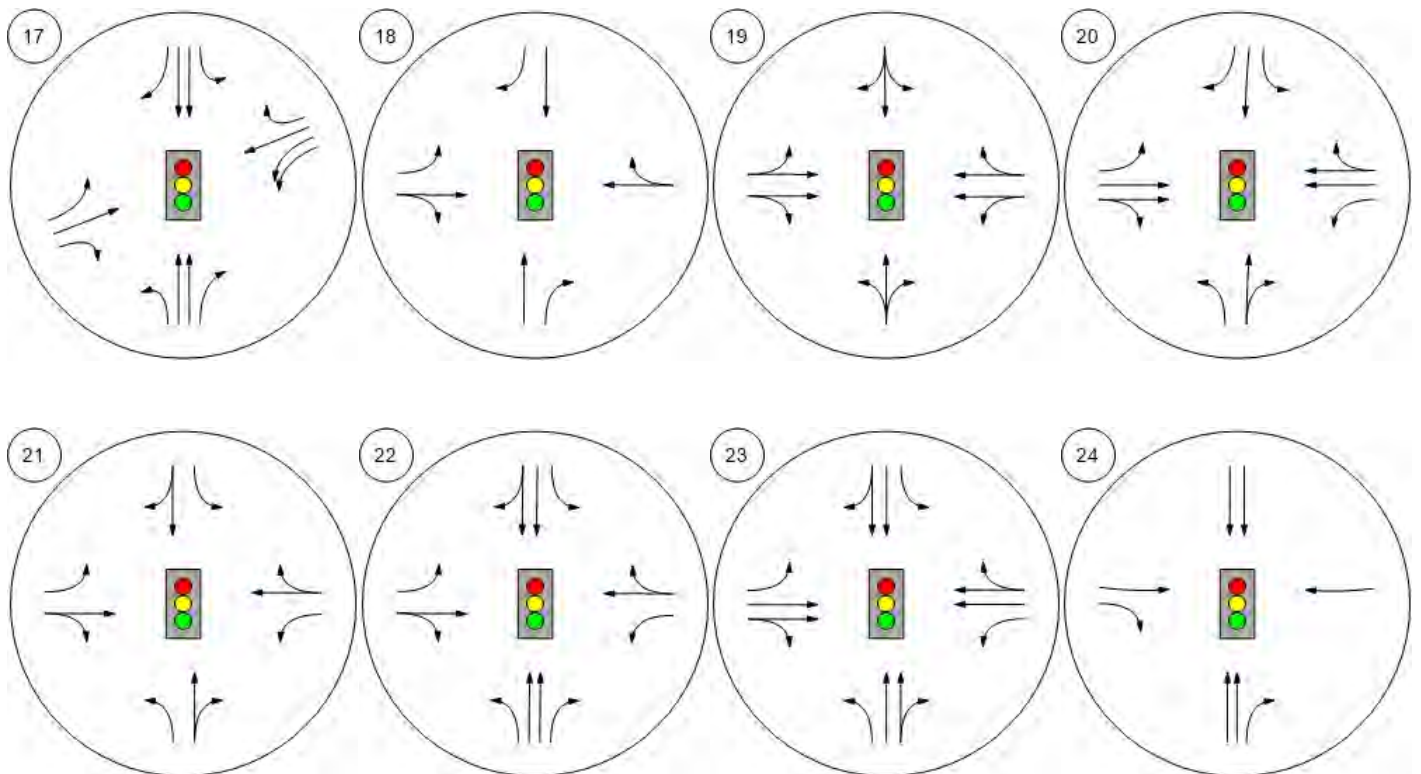
Lane Configuration and Traffic Control



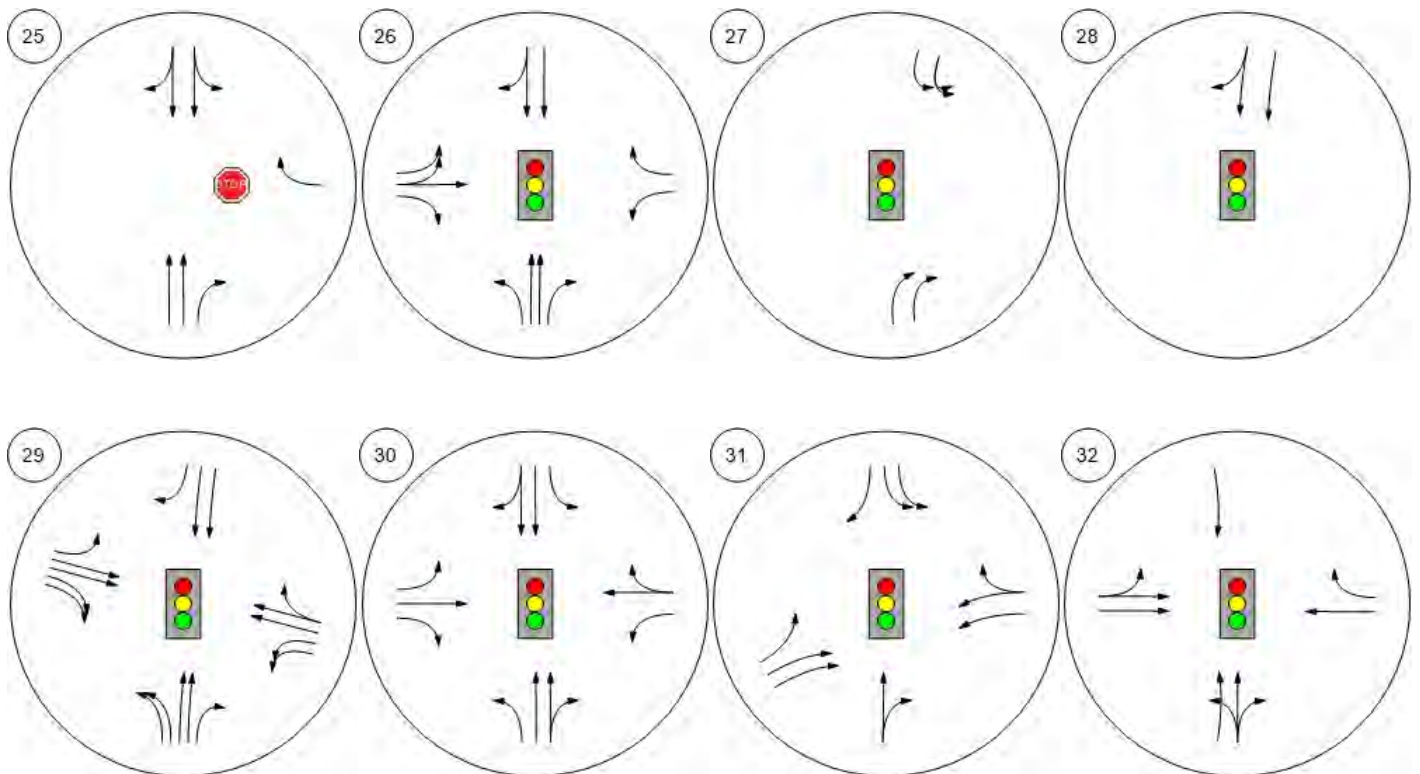
Lane Configuration and Traffic Control



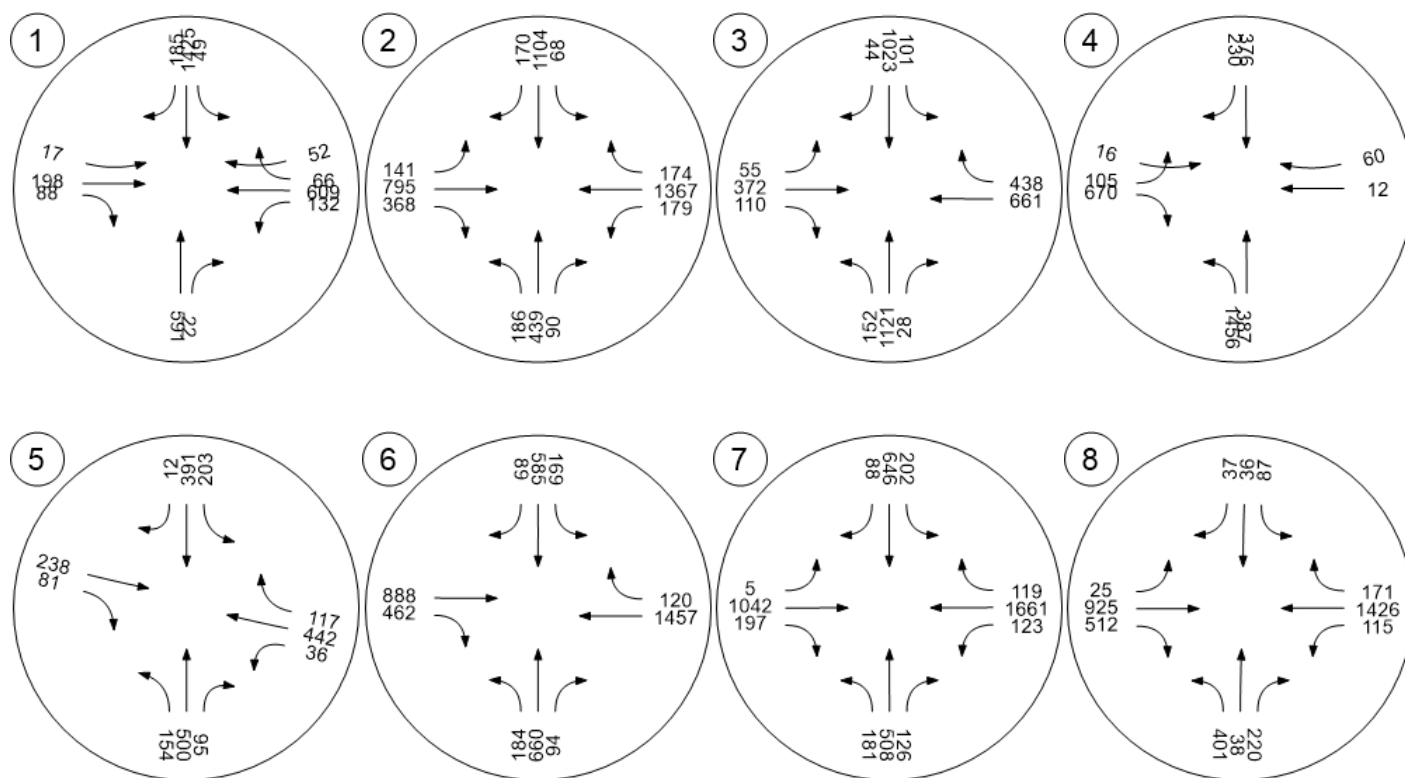
Lane Configuration and Traffic Control



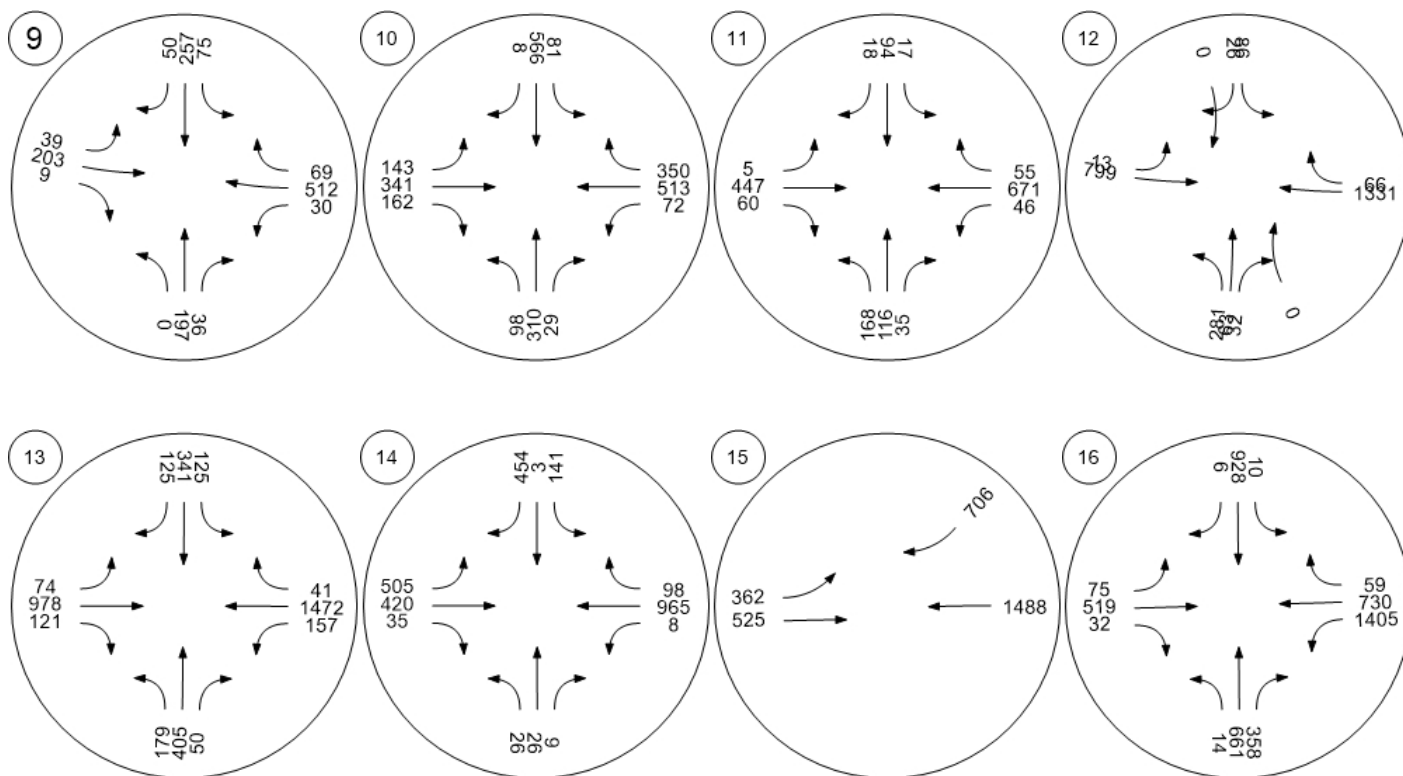
Lane Configuration and Traffic Control



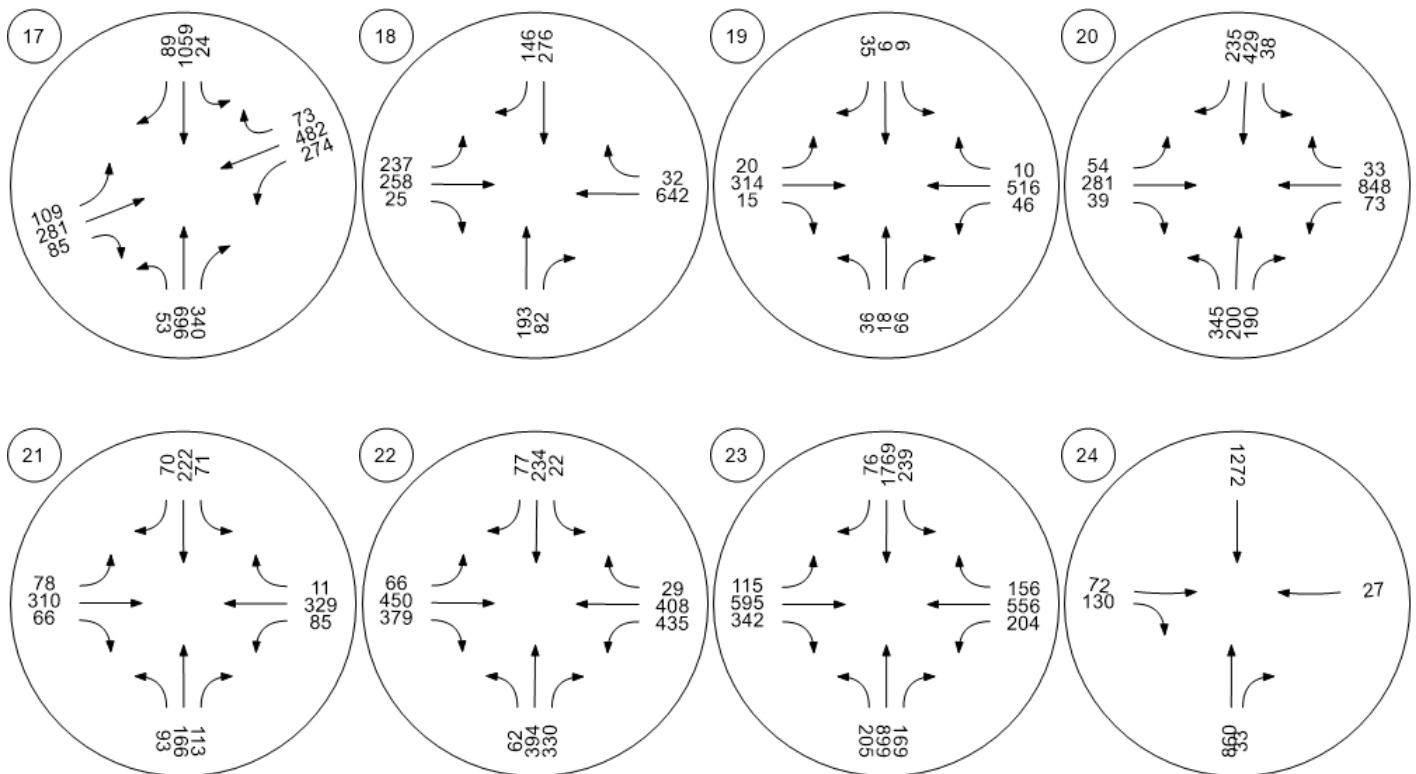
Traffic Volume - Base Volume



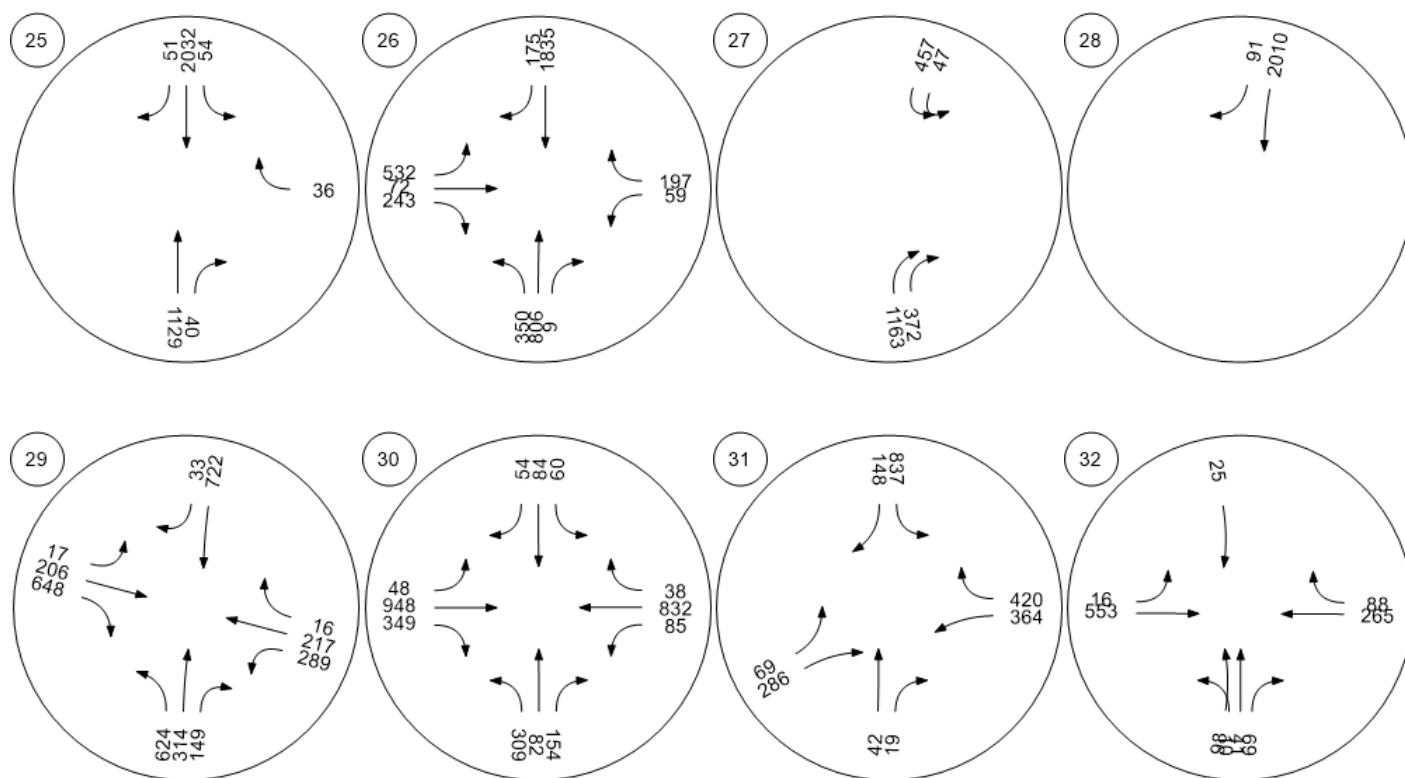
Traffic Volume - Base Volume



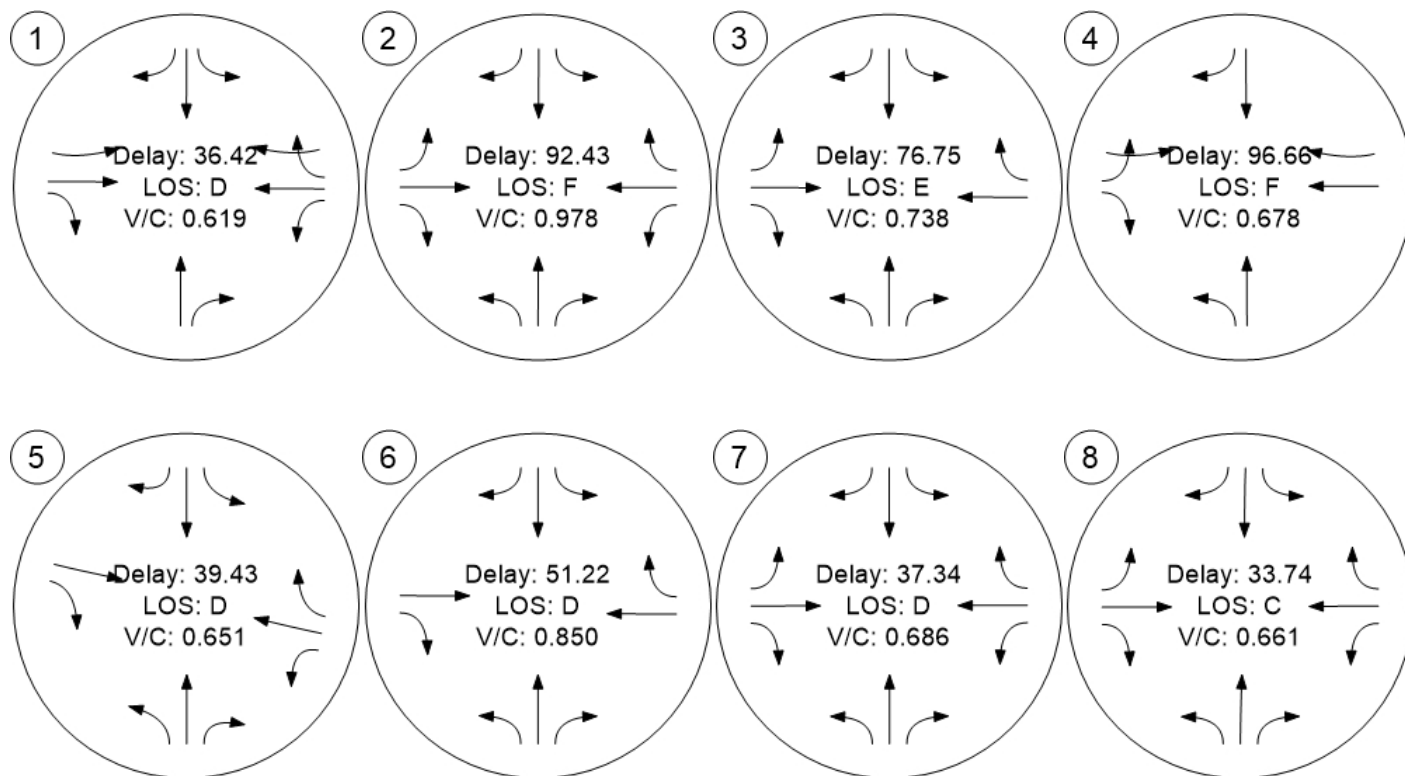
Traffic Volume - Base Volume



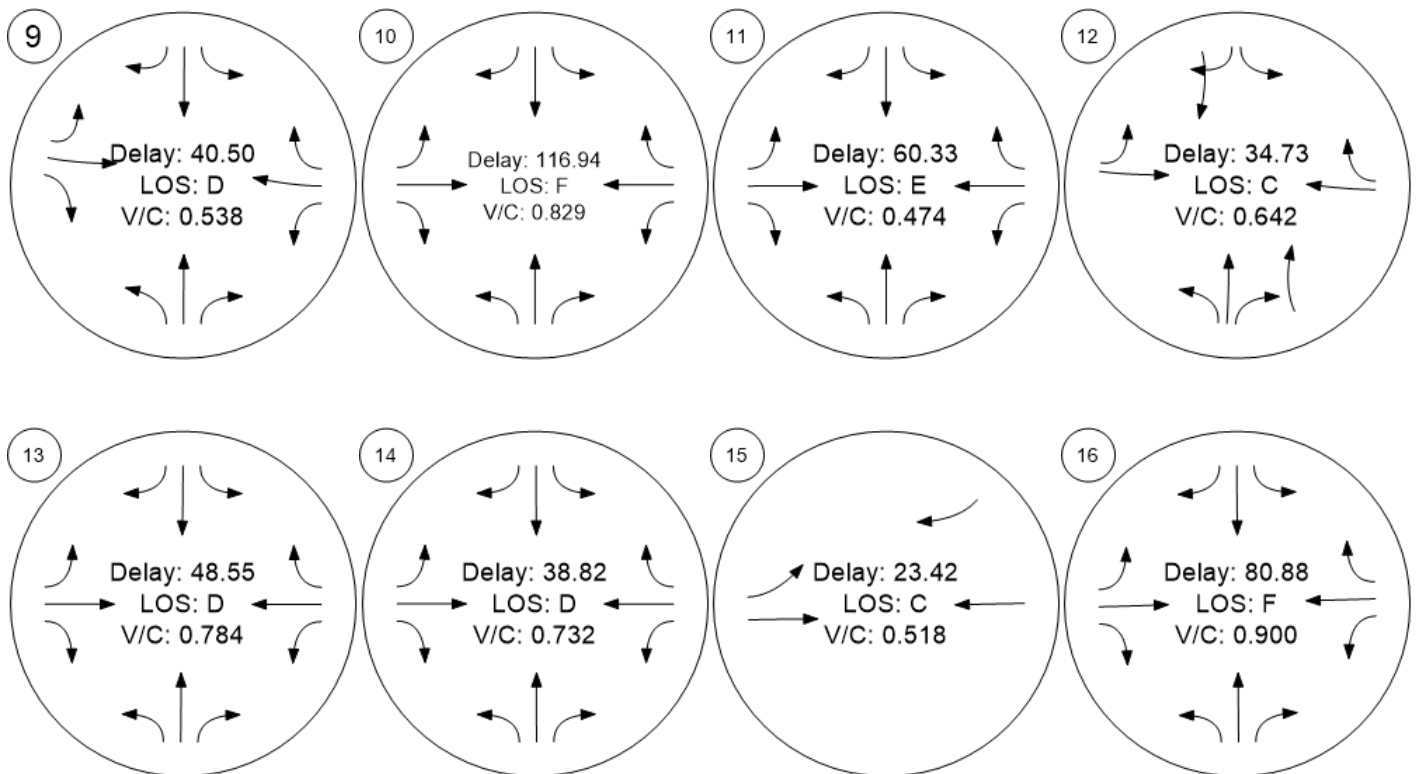
Traffic Volume - Base Volume



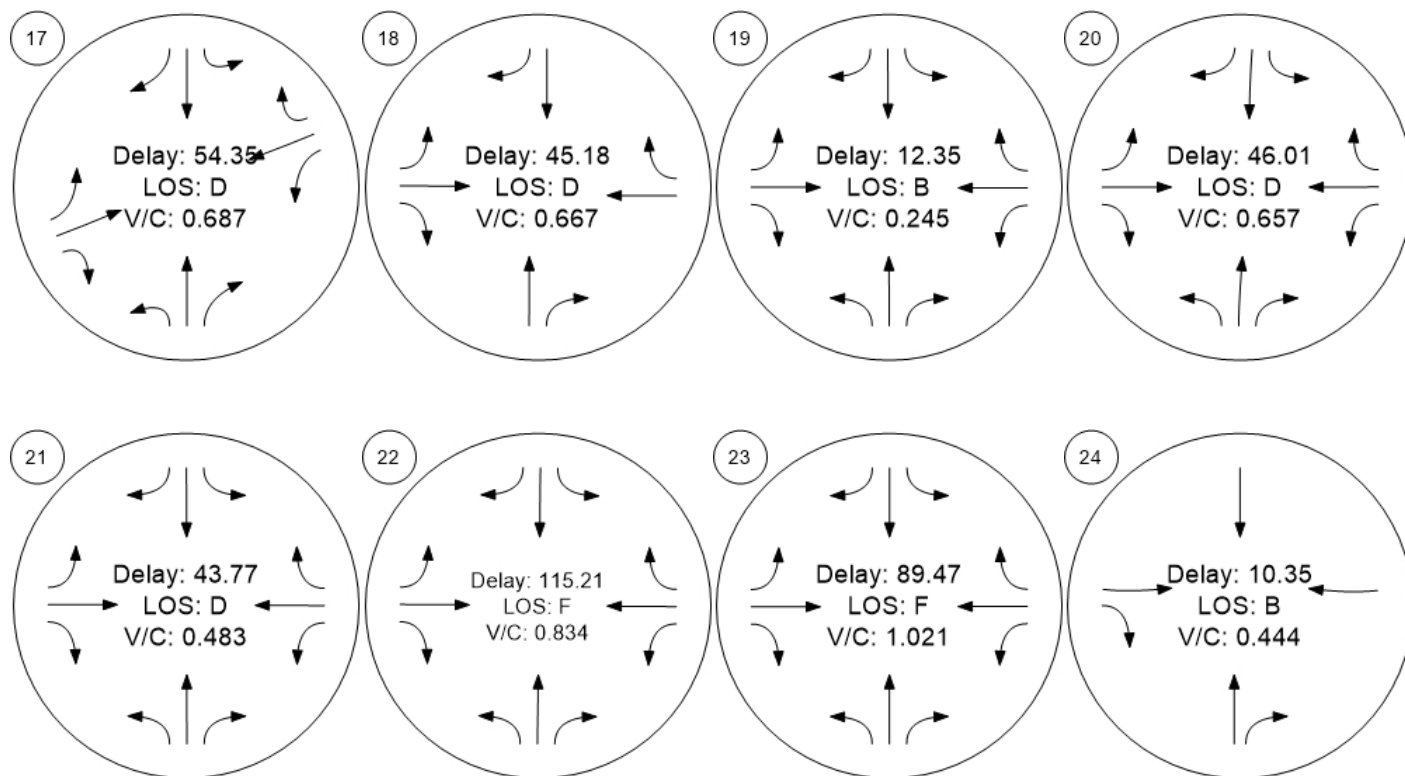
Traffic Conditions



Traffic Conditions



Traffic Conditions



Traffic Conditions

