

Appendix B-2: Level of Service Analysis



Ashland Avenue Bus Rapid Transit Project Environmental Assessment

Memorandum

Date: June 1, 2013

Subject: Intersection Level of Service Methodology

Prepared by: CDM Smith, Inc.

Introduction

The Chicago Transit Authority (CTA), in cooperation with the Chicago Department of Transportation (CDOT), Department of Housing and Economic Development (DHED), and FTA, is proposing to implement Bus Rapid Transit (BRT) features and service along Ashland Avenue in Chicago, Illinois. The limits for the Ashland Avenue Corridor BRT Project (Build Alternative) are:

- Irving Park Road on the north to 95th Street on the south (approximately 16.1 miles)

CTA currently operates local bus service within the Ashland Avenue Corridor BRT Project limits. The proposed improvements are limited in scope and would be implemented within existing roadway rights-of-way:

- Construction of 35 median BRT stations with shelters and pedestrian boarding areas
- Upgrade of traffic signal systems to include transit signal priority
- Implementation of queue jump lanes and turn restrictions at intersections
- Removal of travel lanes and left-turn lanes to accommodate a designated bus lane in each direction

Purpose

The purpose of this memorandum is to describe the methodology used to develop Build Alternative traffic volumes that would result from removing a lane in each direction and removal of left turns along Ashland Avenue. Detailed results tables and schematics are provided in **Attachment A**.

Methodology

The methodology and database tool described below was developed to aid in developing Build Alternative traffic volumes by formalizing a traffic diversion analysis process for Ashland Avenue itself that provides a flexible and modular way of reviewing impacts to traffic volumes on adjacent roadways resulting from implementation of the project.

The Chicago Metropolitan Agency for Planning (CMAP) provided an Existing (No-Build) and Build Alternative model output for this project based on 2010 data. Existing intersection turning movement counts along Ashland Avenue were adjusted using the following methodology:

1. Northbound (NB) and southbound (SB) left, through, and right volumes were adjusted proportional to the change in the corresponding CMAP model link volumes for Ashland Avenue. To account for typical model variations, a floor and a ceiling were applied to the CMAP model link volume ratios. A 0.5 floor was established along most of Ashland Avenue, ensuring that at least half of the traffic is maintained under With Project conditions. A 0.66 floor was established in areas where there are currently three through lanes of traffic, ensuring at least 2/3rds of traffic is represented in With Project conditions. A 0.8 ceiling was established along all portions of Ashland Avenue. **Figures 2 and 3** show the northbound and southbound CMAP Build Alternative and No-Build (existing conditions) link volume ratios and the final set of ratios for adjustments using a floor and ceiling.
2. NB and SB left turning volumes were similarly adjusted as described above for through and right volumes. The resulting adjusted volumes were then rerouted using a combination of five possible routing options. For the first four rerouting options the left turn volumes begin on Ashland Avenue and reroute through the adjacent street network, while the last option accounts for additional left turning traffic that reroutes completely off of Ashland Avenue:
 - A. Left turns are allowed at the current intersection and no rerouting takes place
 - B. Left turning traffic reroutes to a nearby upstream or downstream intersection where lefts are allowed
 - C. Left turning traffic reroutes as a right turn off Ashland Avenue and then becomes an eastbound (EB) or Westbound (WB) through at the nearest possible upstream crossing
 - D. Left turning traffic reroutes as a right turn off Ashland Avenue and then becomes an EB or WB through at the nearest possible downstream crossing
 - E. Left turning traffic reroutes off of Ashland Avenue and shows up as an EB or WB through at the nearest upstream or downstream crossing
3. At cross street locations where a raised median is installed as part of the project, eastbound and westbound left and through volumes were rerouted to the nearest north and south crossing locations.
4. After the above adjustments were made to existing eastbound and westbound volumes, the eastbound and westbound volumes were then adjusted upward, if necessary, to match the proportional changes in the corresponding CMAP model link volumes.

A Microsoft Access database was developed to automate the re-routing process for all intersections along the corridor. Attributes were defined in the database for each cross street along Ashland Avenue detailing whether left turns are allowed at the intersection and its ability to serve as a route for rerouted left turn traffic, including whether the road is a one-way street, T-intersection, alley, shopping center access road, etc.

The database determined for each intersection which of the five possible routing options would be available based on the attributes defined for nearby cross streets. Left turns were then rerouted based on an assumed distribution amongst the five possible routing options, as explained above. While only the results of one scenario of left turn removals is provided in traffic analysis for the Environmental Assessment, the Access database provides the flexibility to analyze different left turn or routing scenarios relatively quickly. As the location of allowed left turns area adjusted, the Access database automatically re-adjusts the possible routing options for the left turning traffic at that intersection and generates new turning movement volumes that can be directly input into the Synchro intersection traffic model.

Figure 2: CMAP Model With Project/Existing Conditions Link Volume Ratios on Ashland Avenue

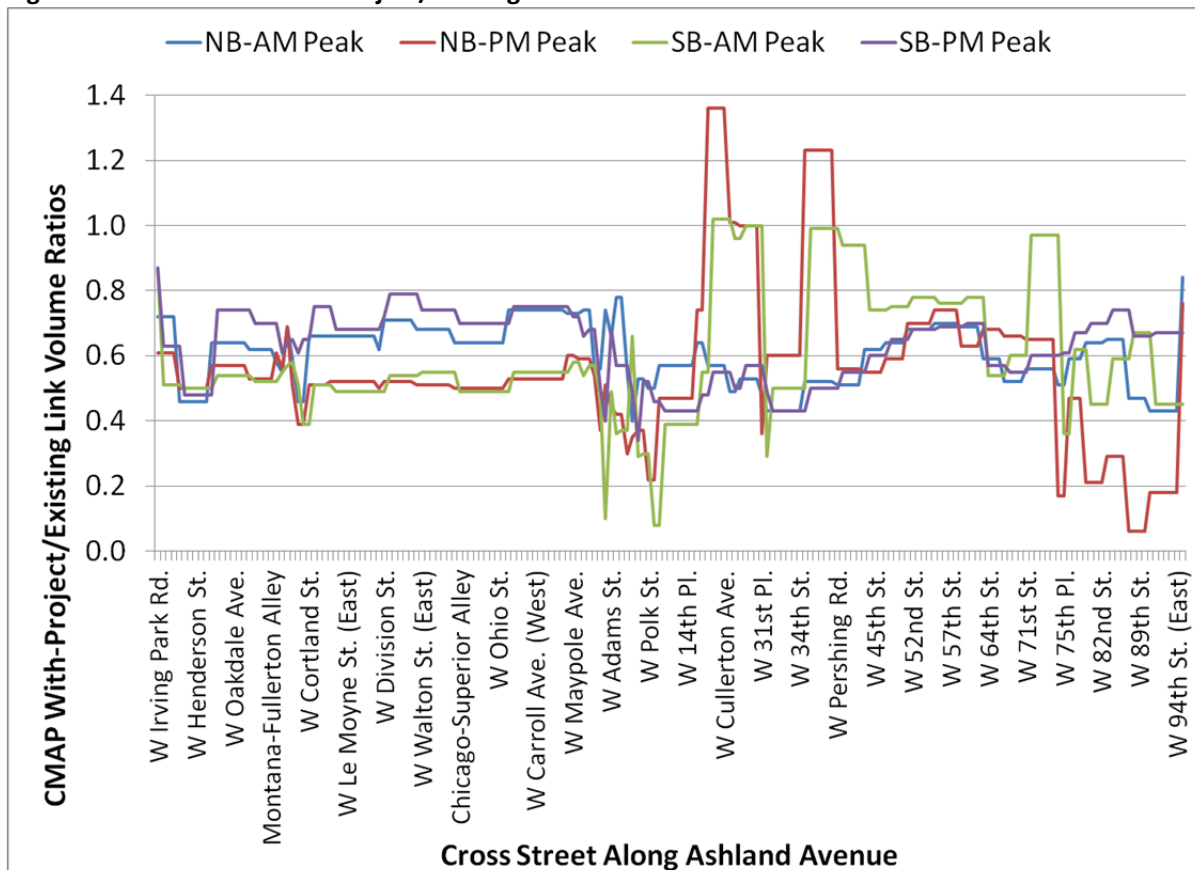
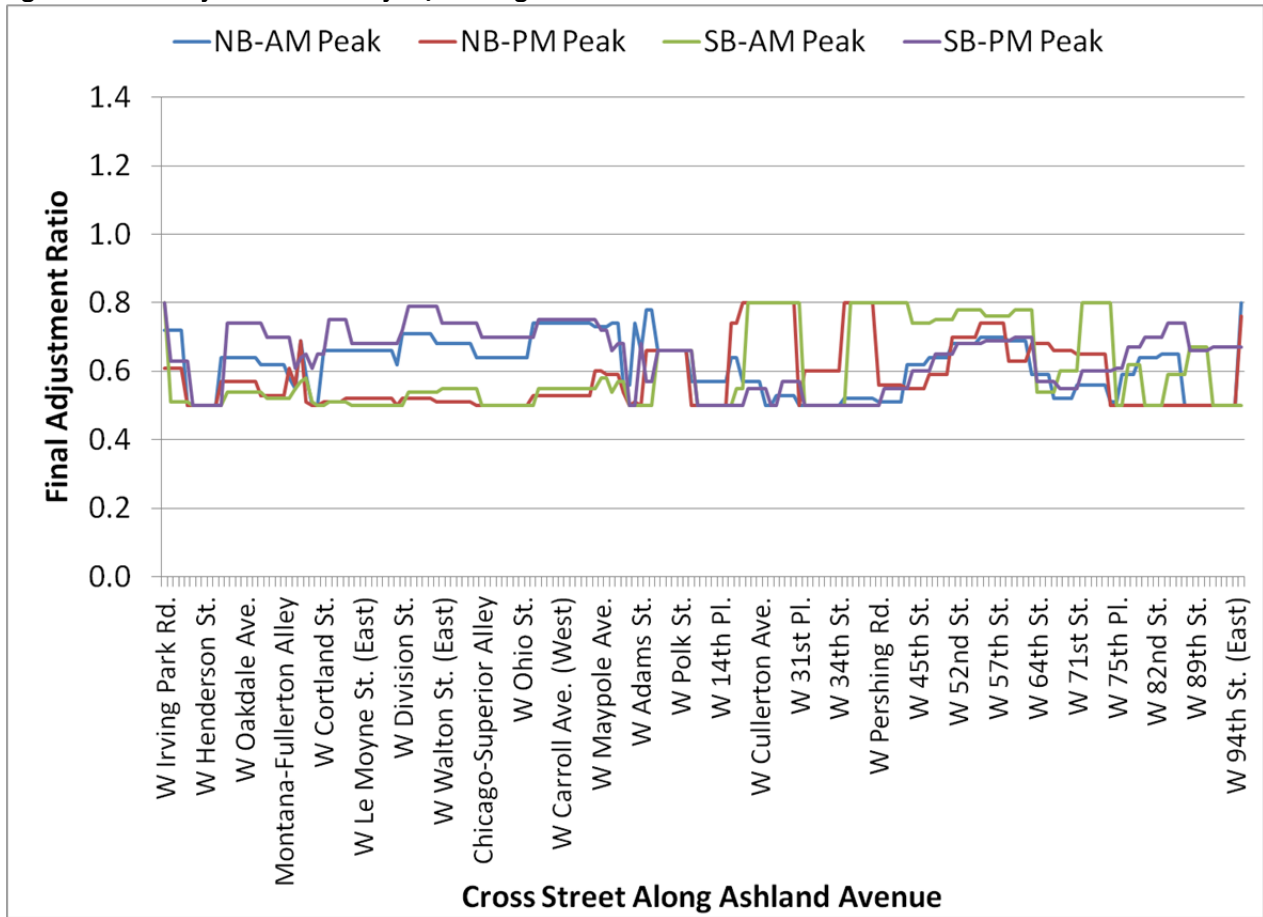
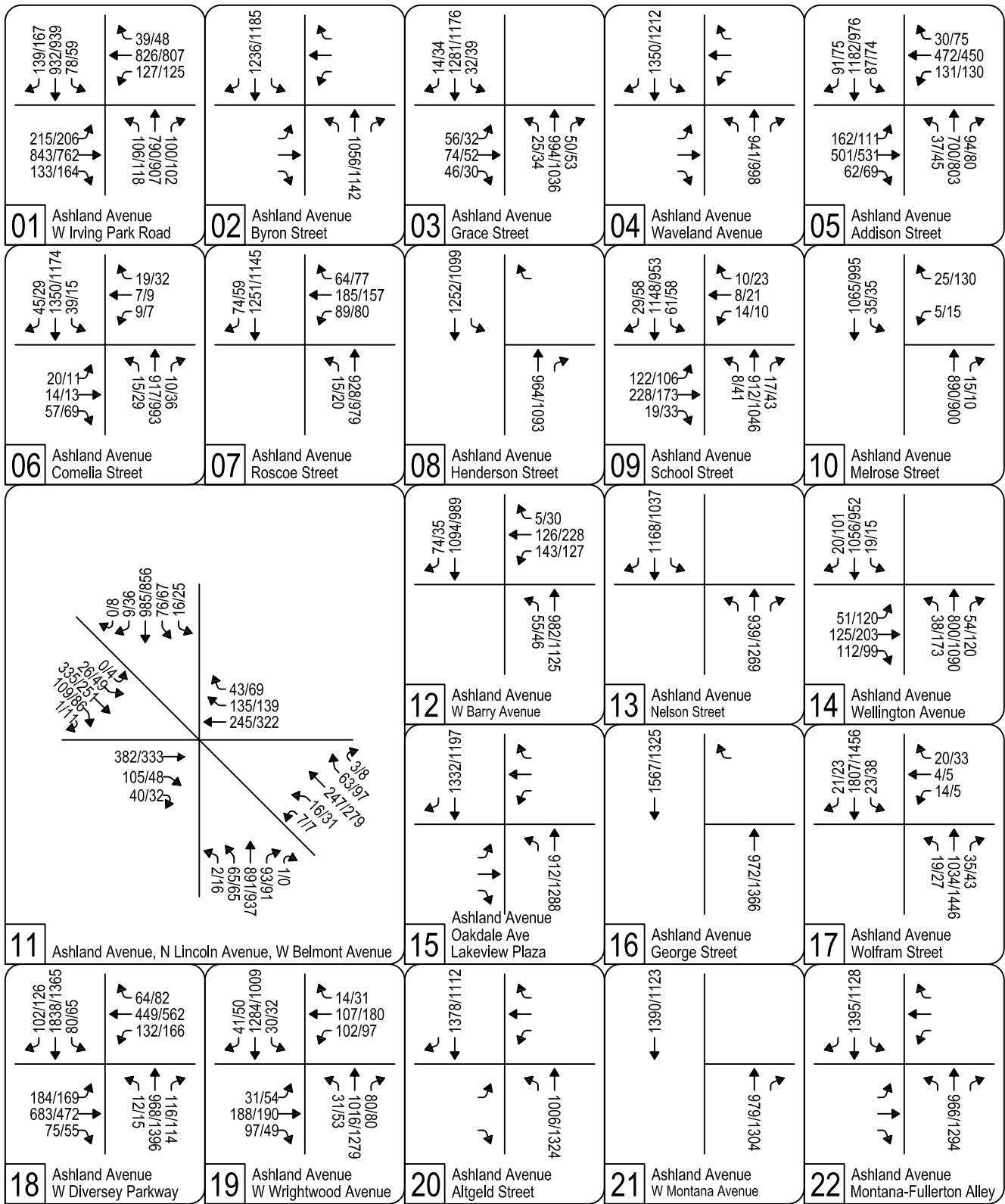


Figure 3: Final Adjusted With Project/Existing Conditions Link Volume Ratios on Ashland Avenue

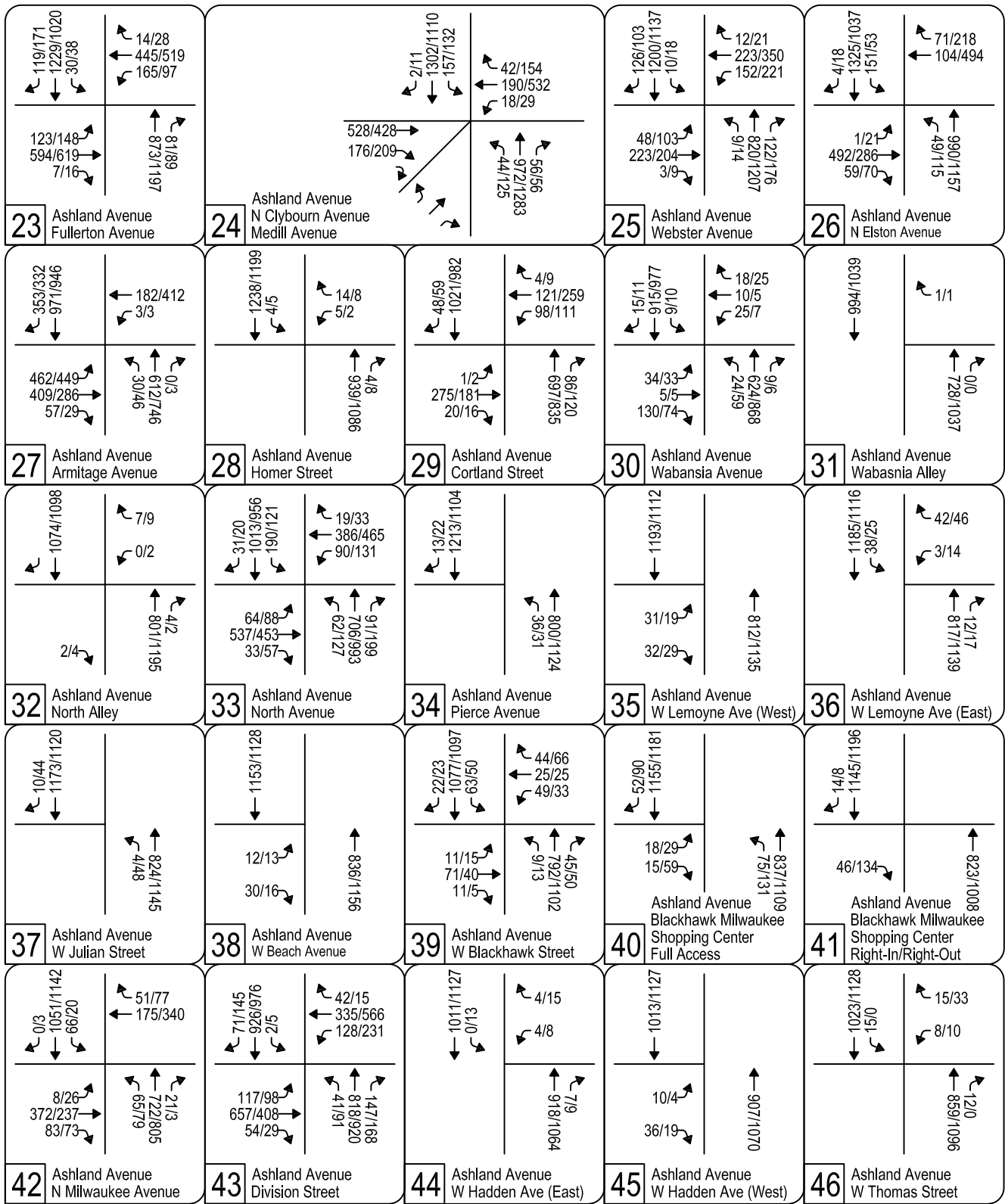


Existing Volume Schematics



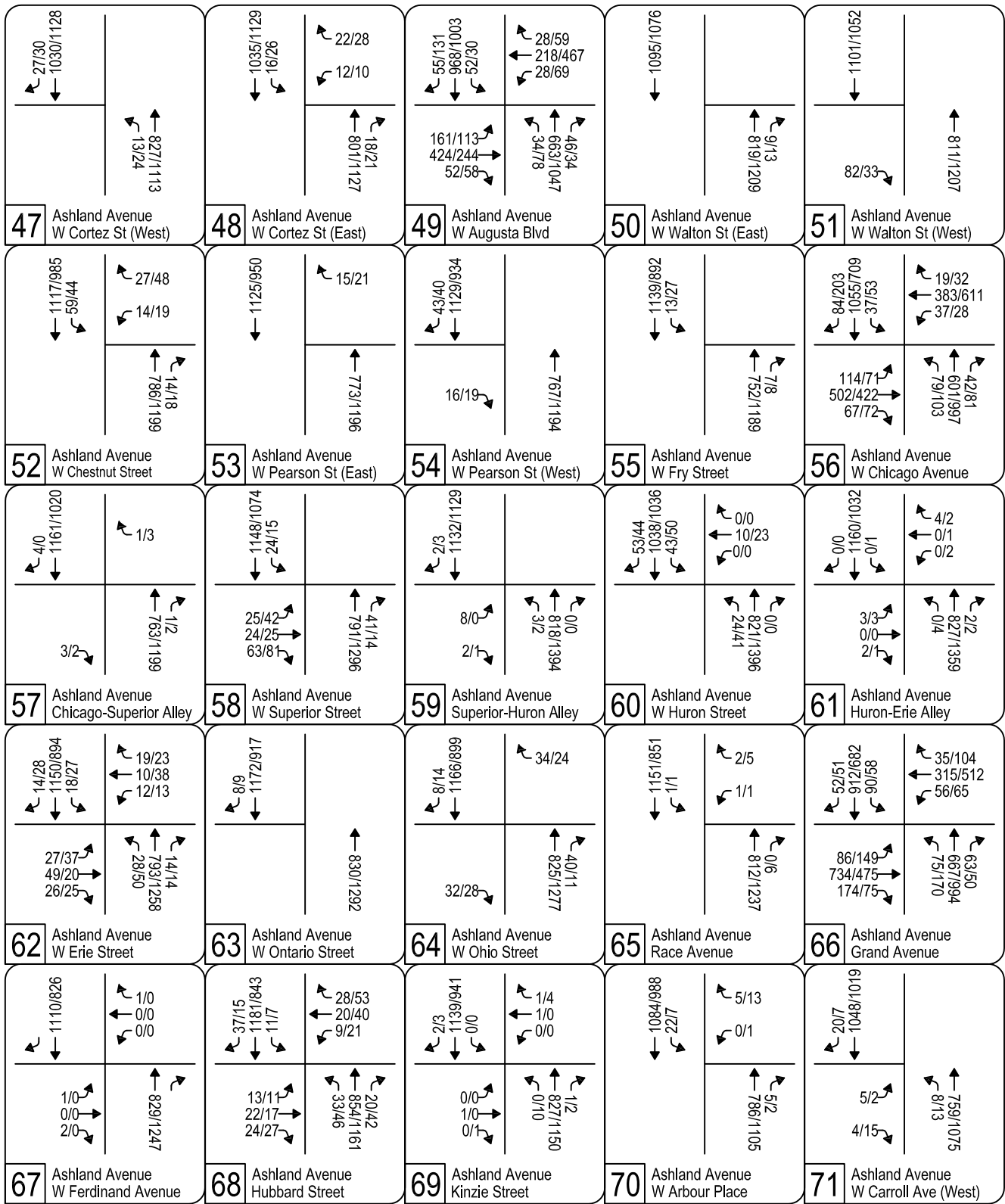
Existing Conditions

Legend: AM/PM Peak Hour Volumes (vph)



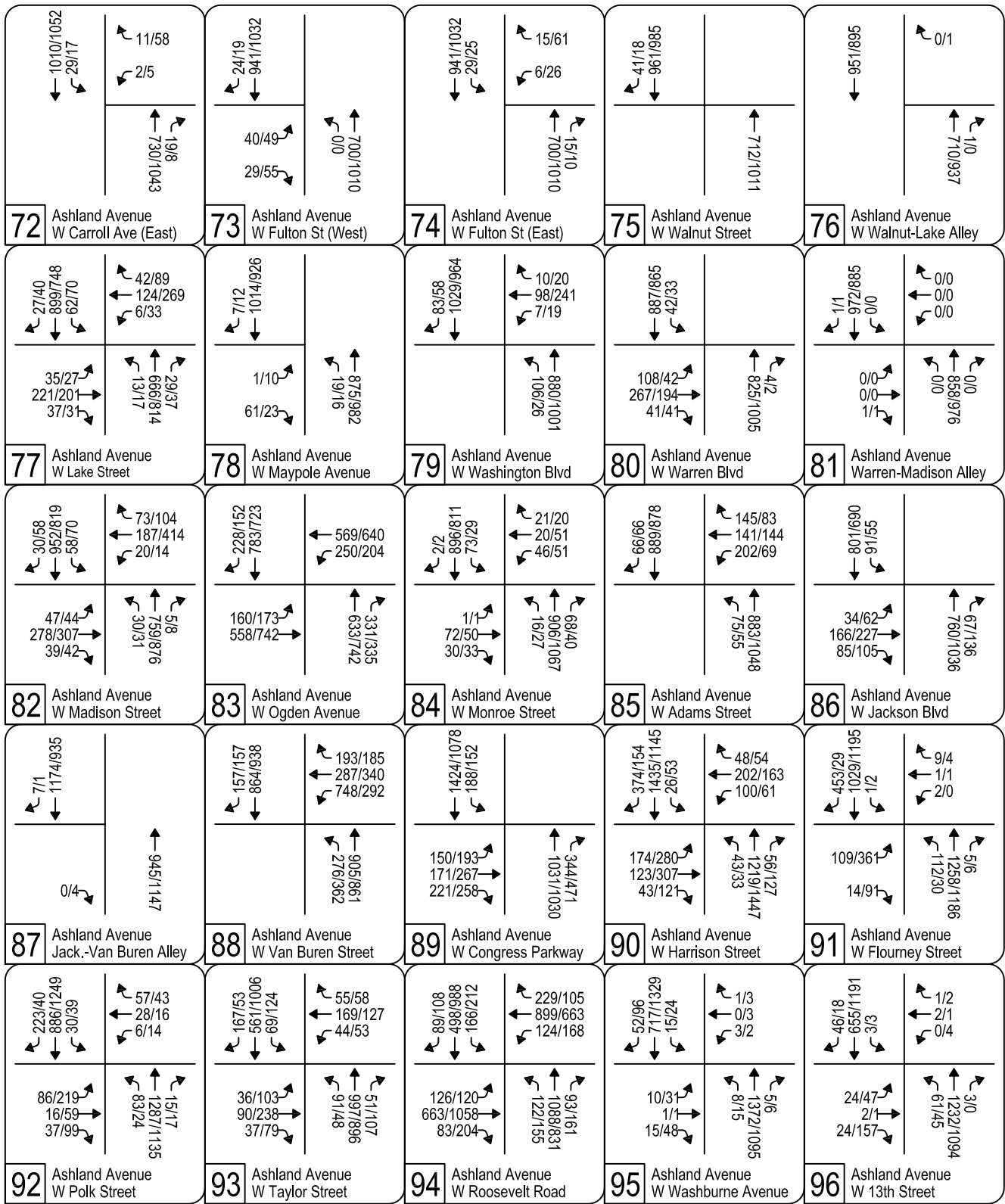
Existing Conditions

Legend: AM/PM Peak Hour Volumes (vph)



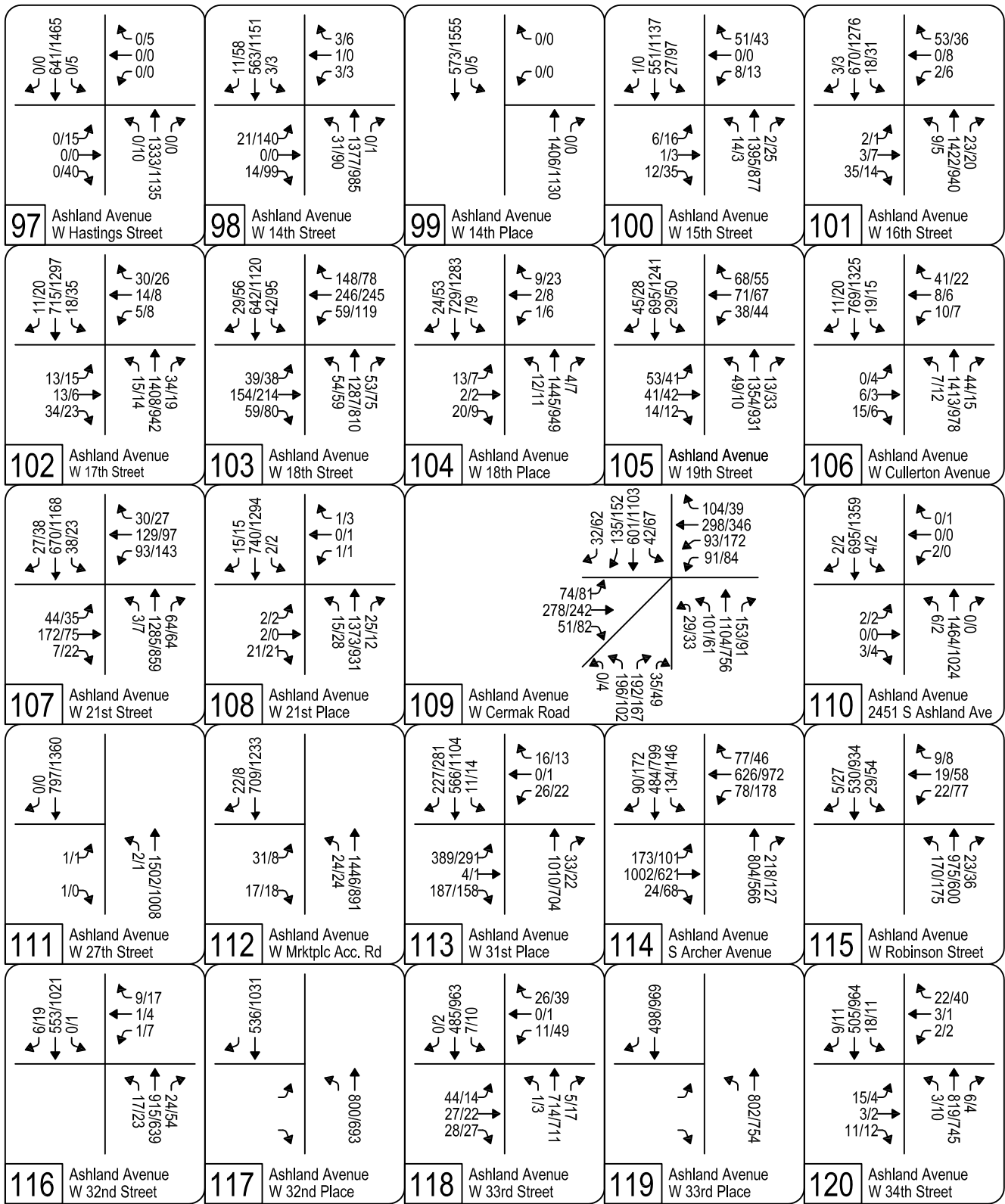
Existing Conditions

Legend: AM/PM Peak Hour Volumes (vph)



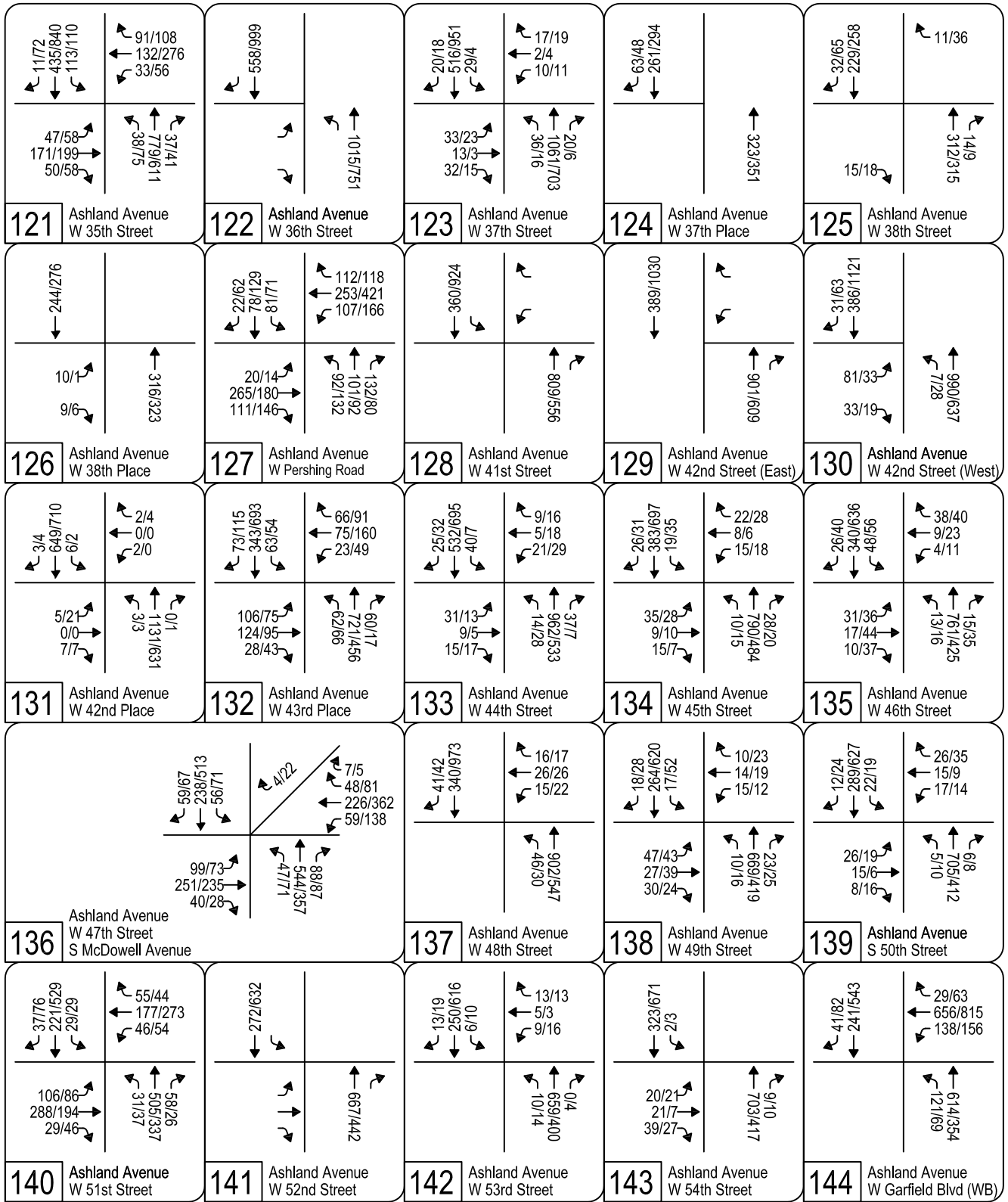
Existing Conditions

Legend: AM/PM Peak Hour Volumes (vph)



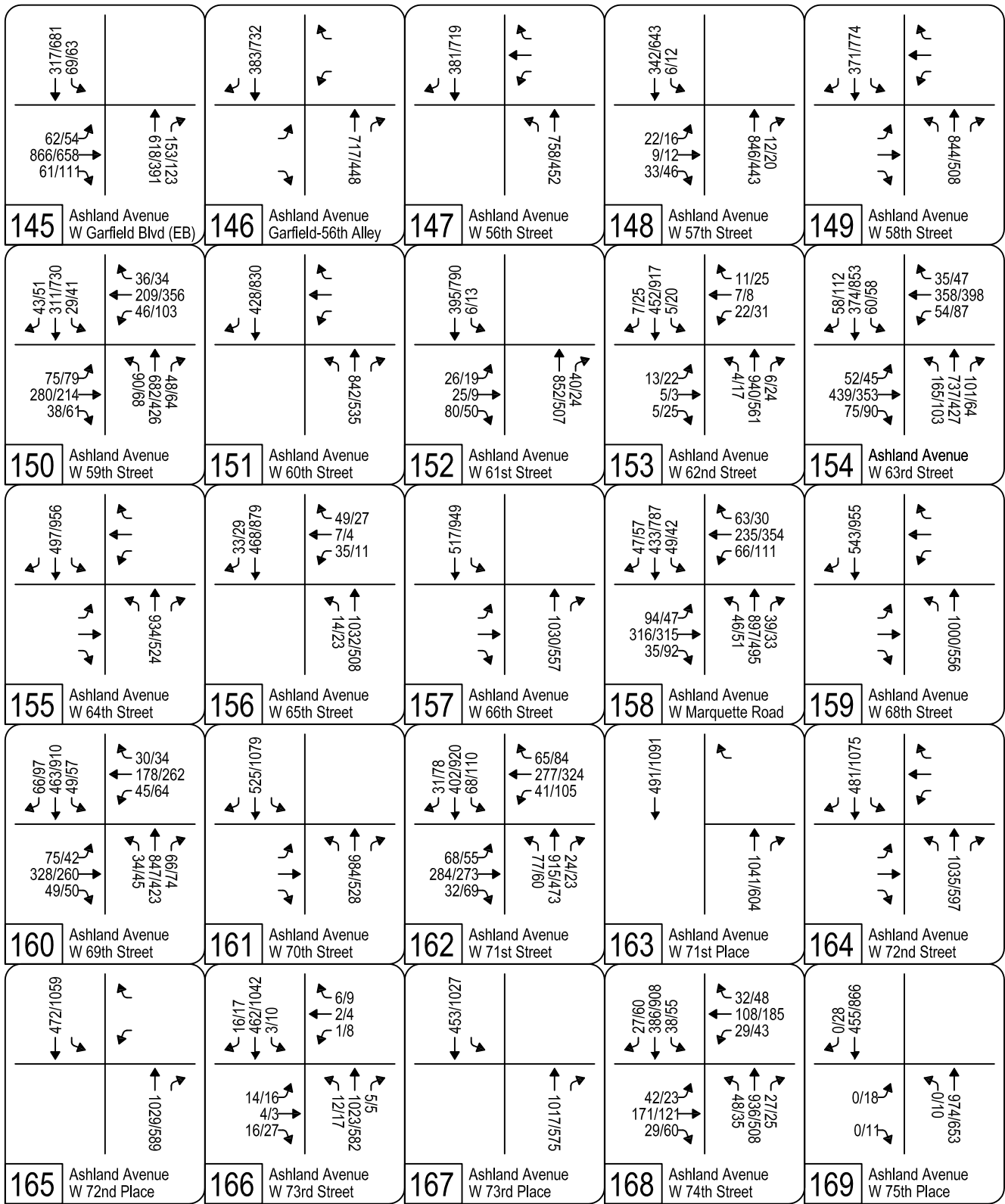
Existing Conditions

Legend: AM/PM Peak Hour Volumes (vph)



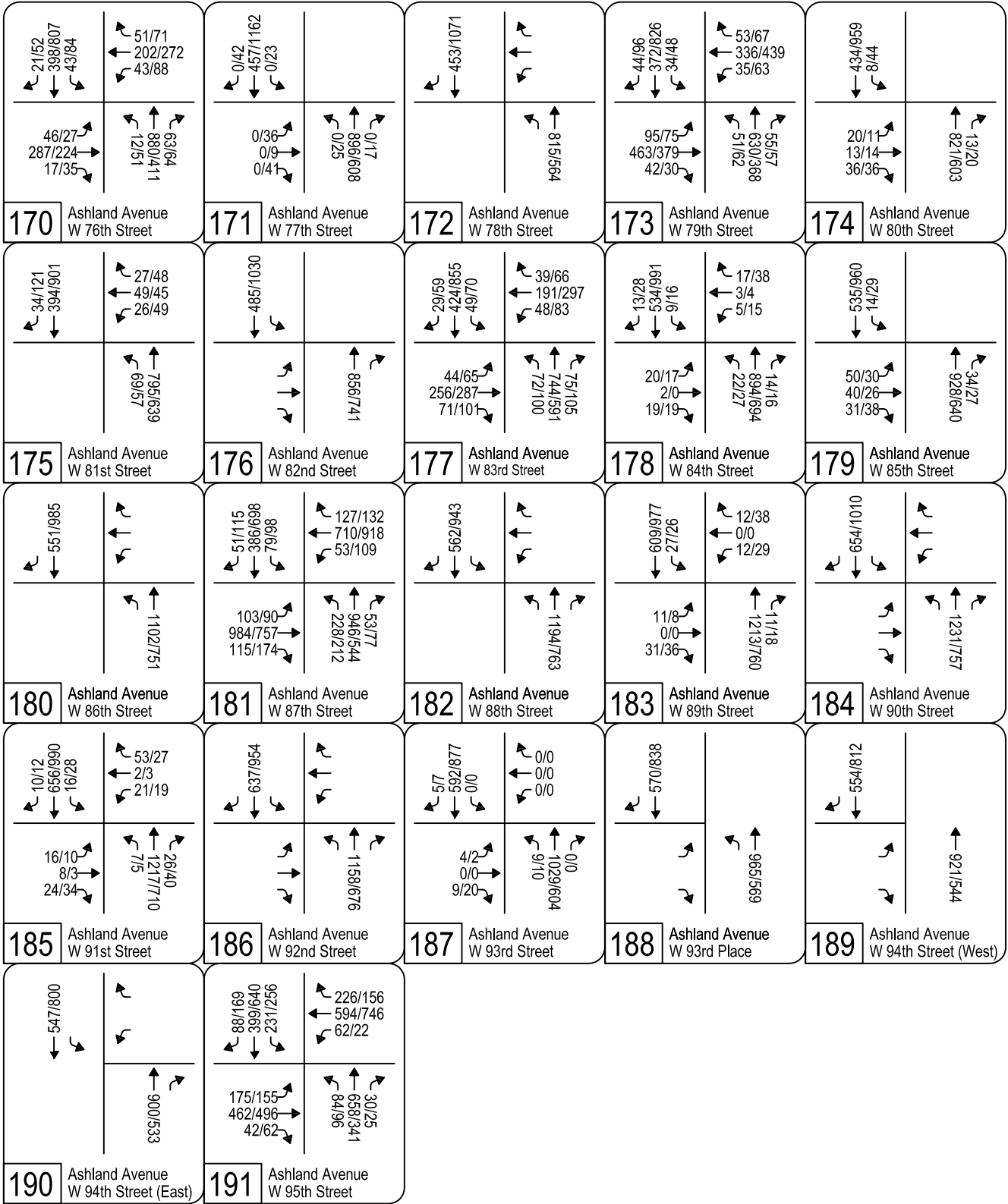
Existing Conditions

Legend: AM/PM Peak Hour Volumes (vph)



Existing Conditions

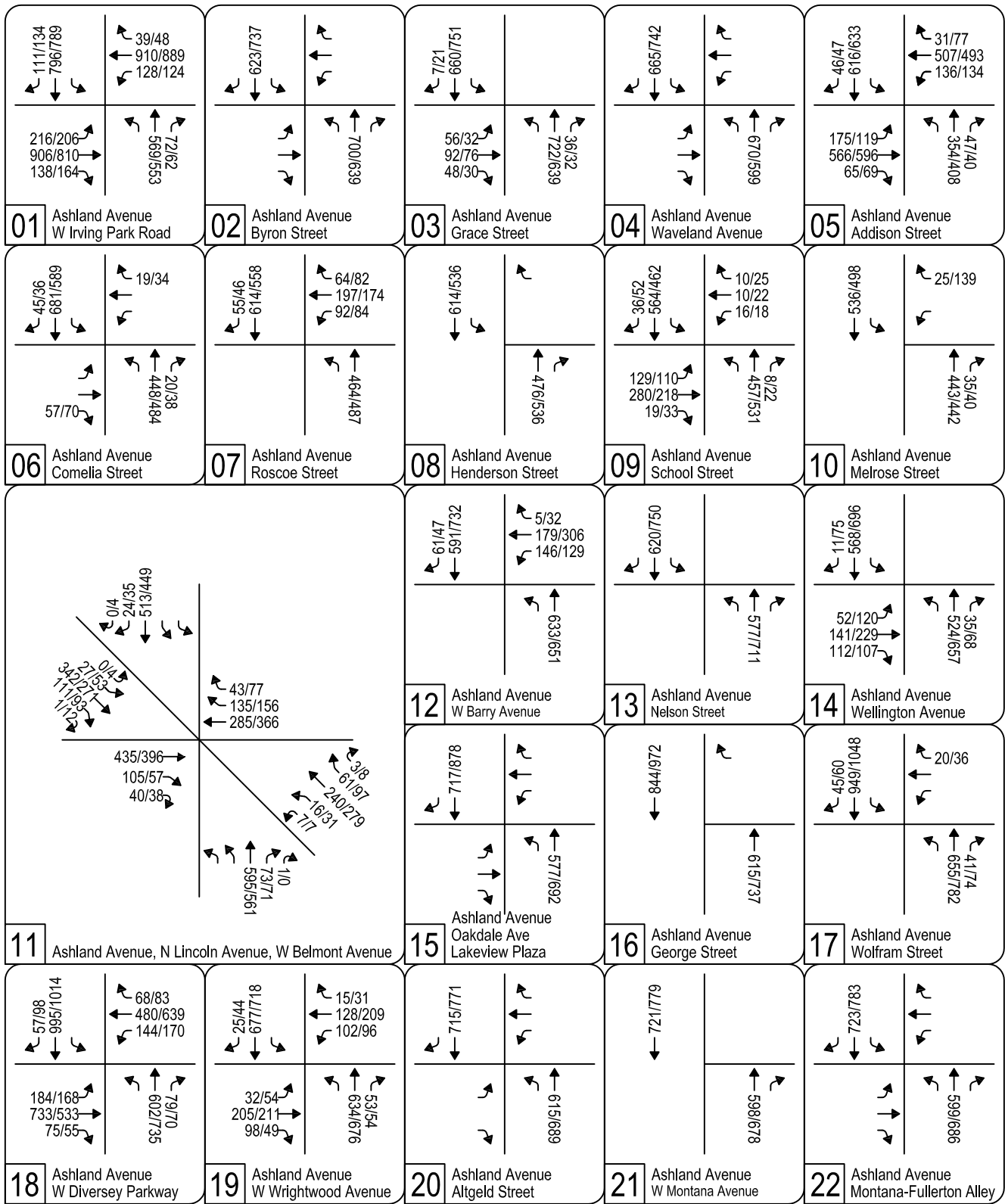
Legend: AM/PM Peak Hour Volumes (vph)



Existing Conditions

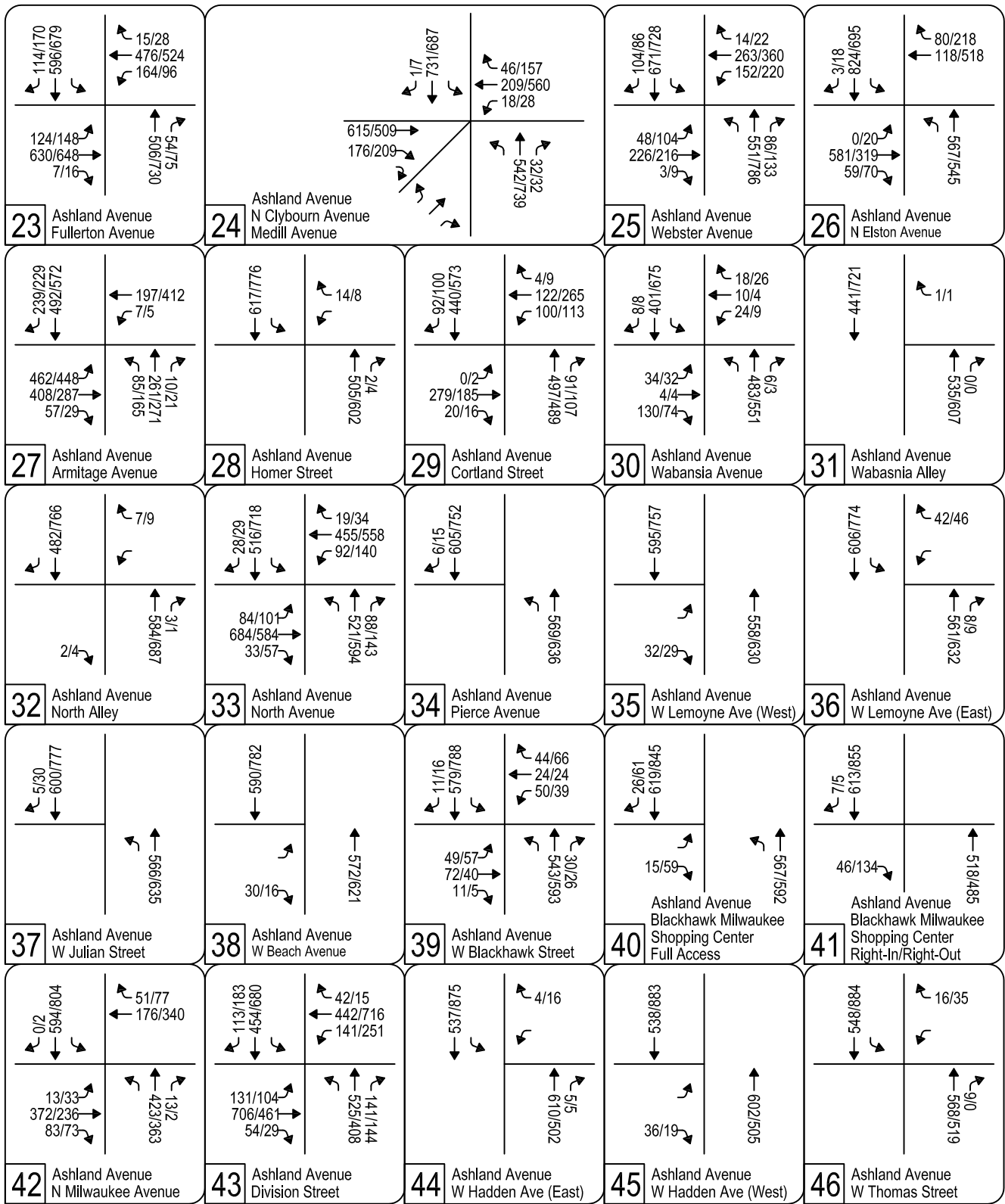
Legend: AM/PM Peak Hour Volumes (vph)

Build Alternative Volume Schematics



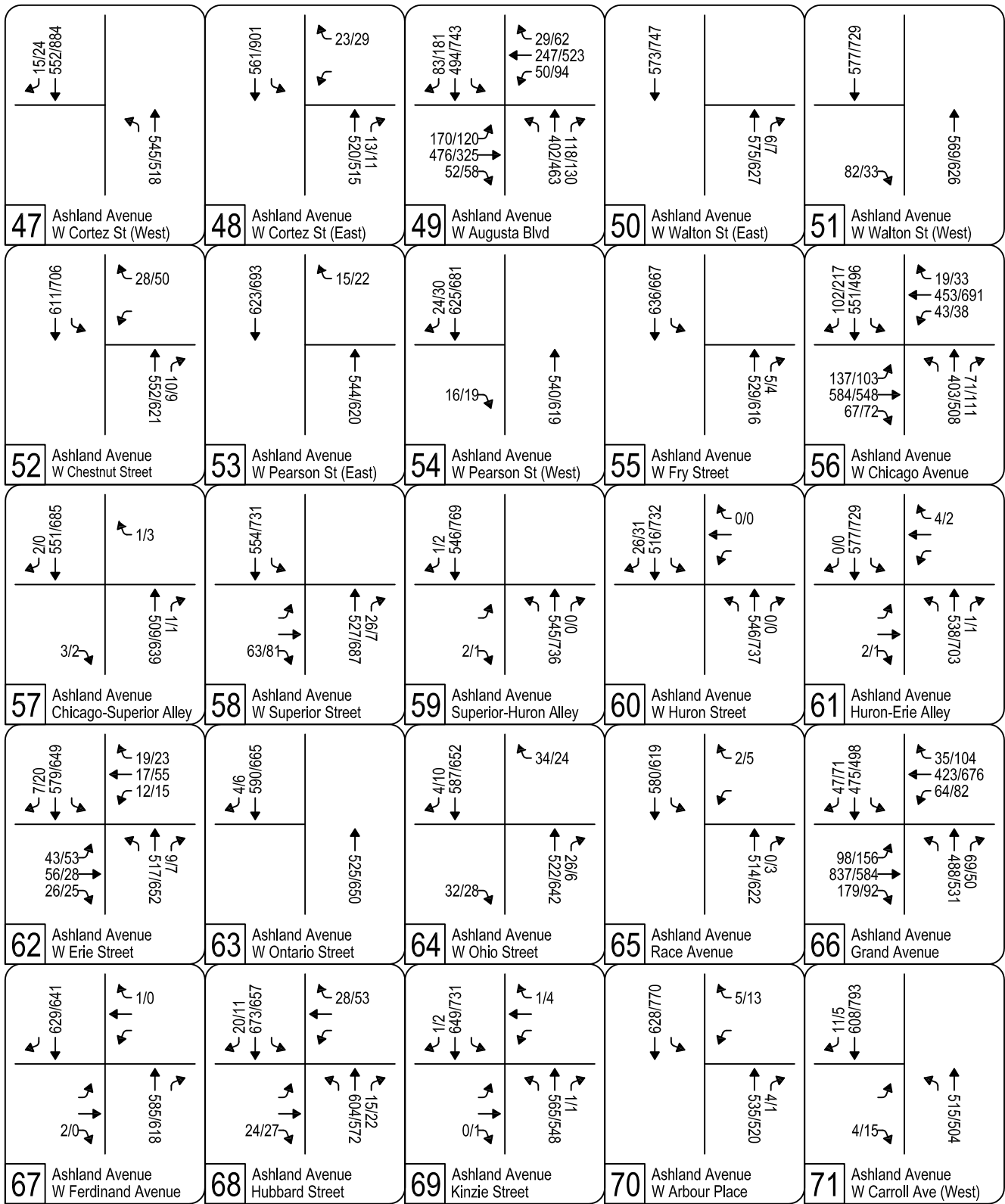
Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



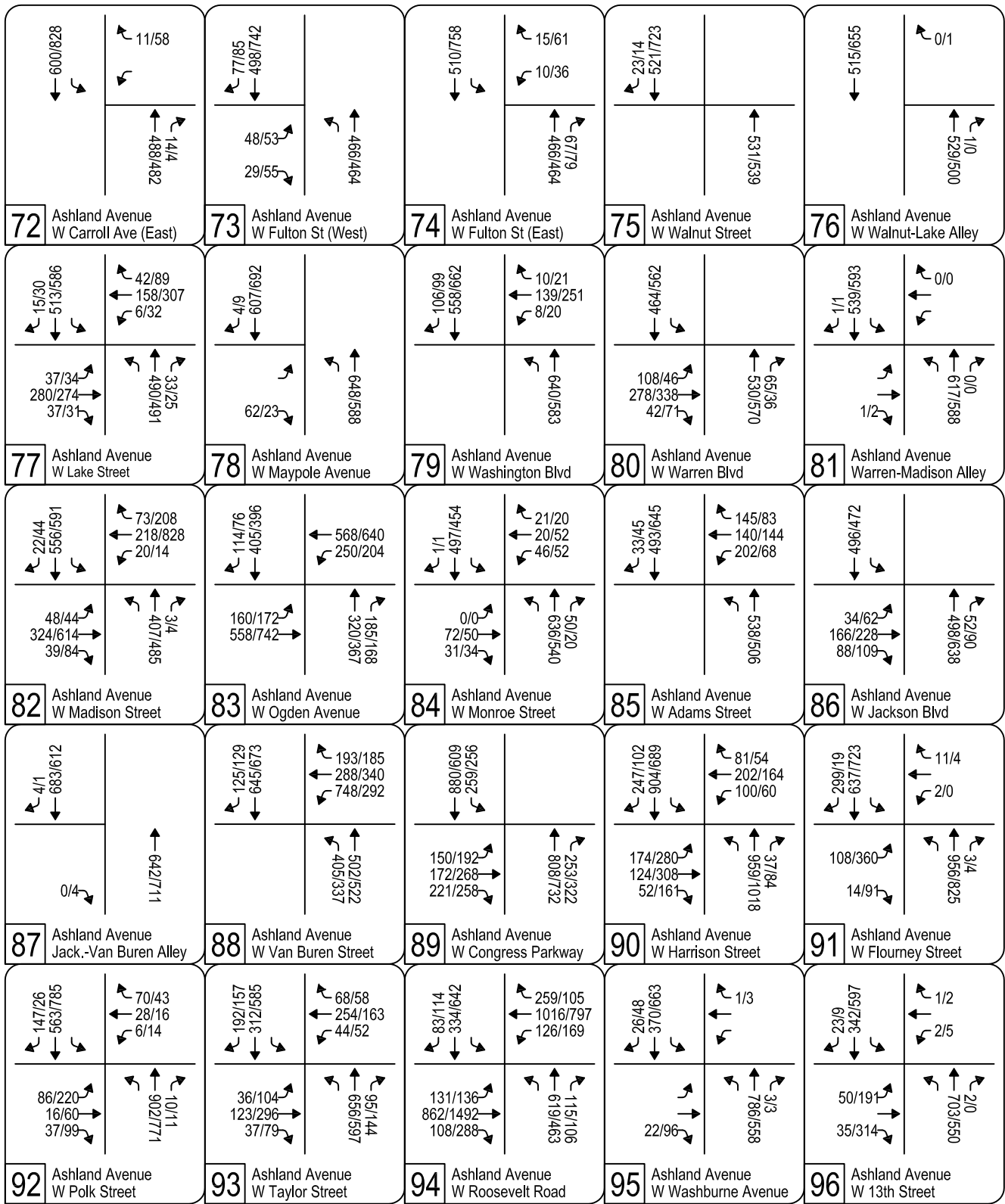
Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



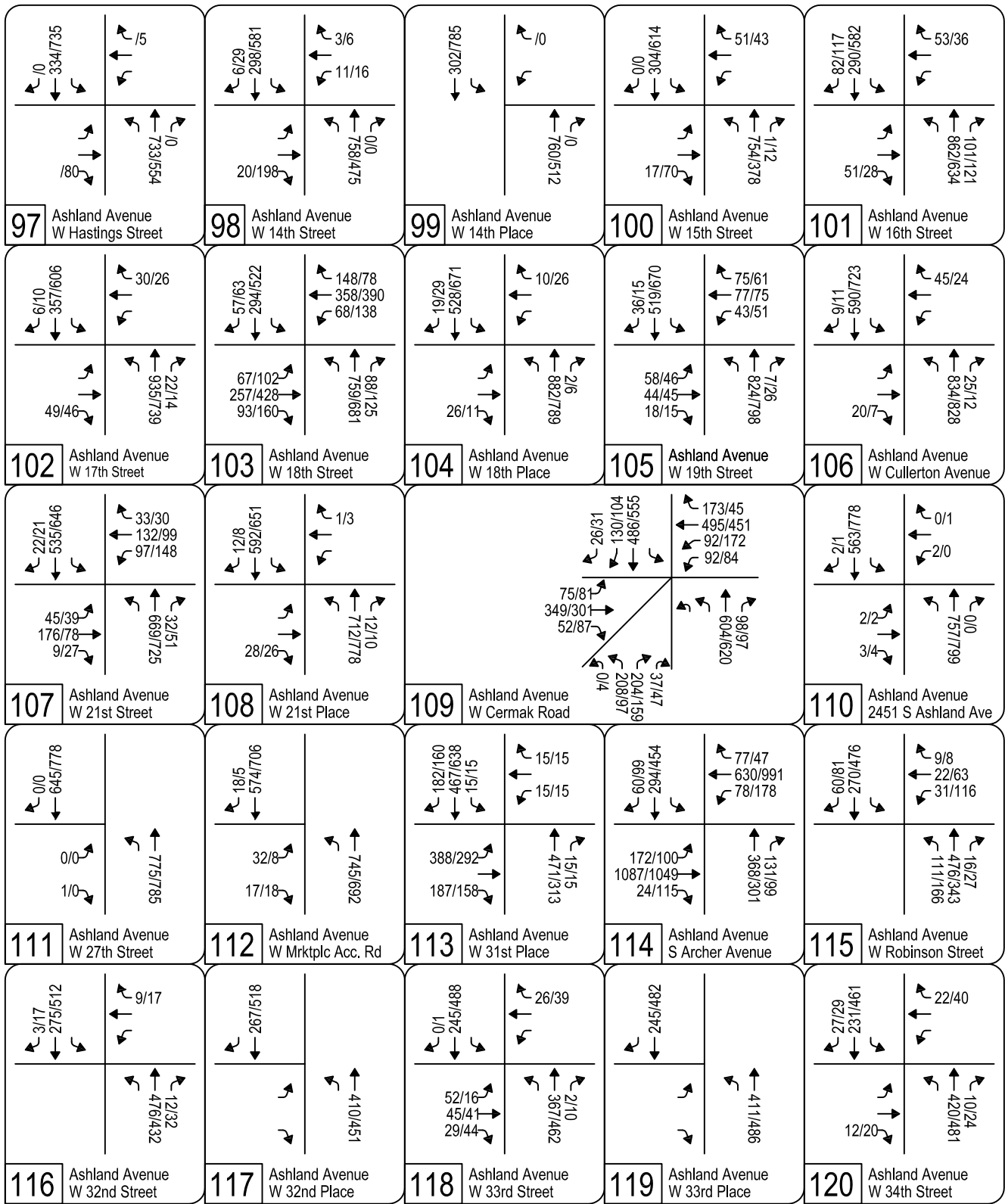
Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



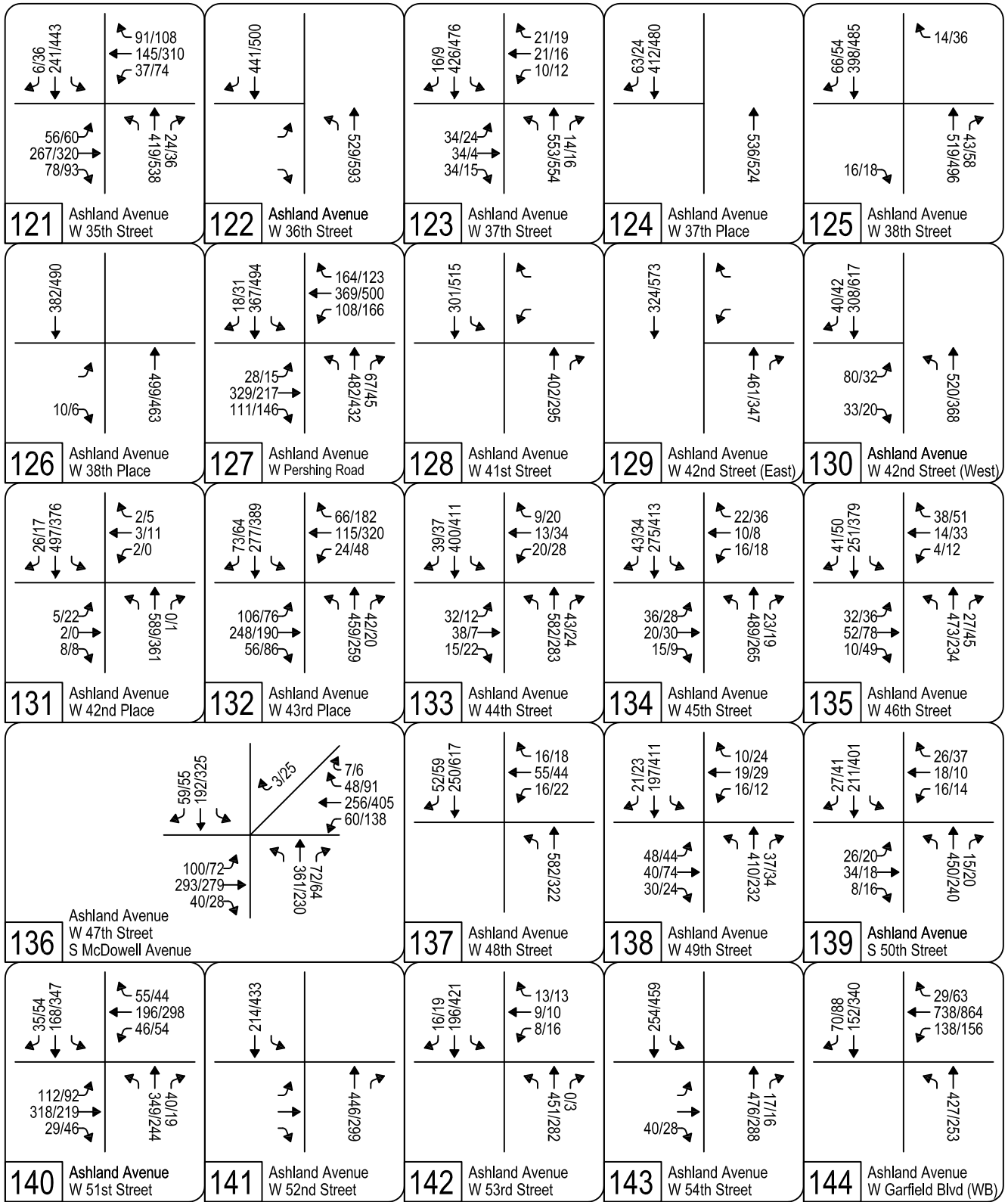
Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



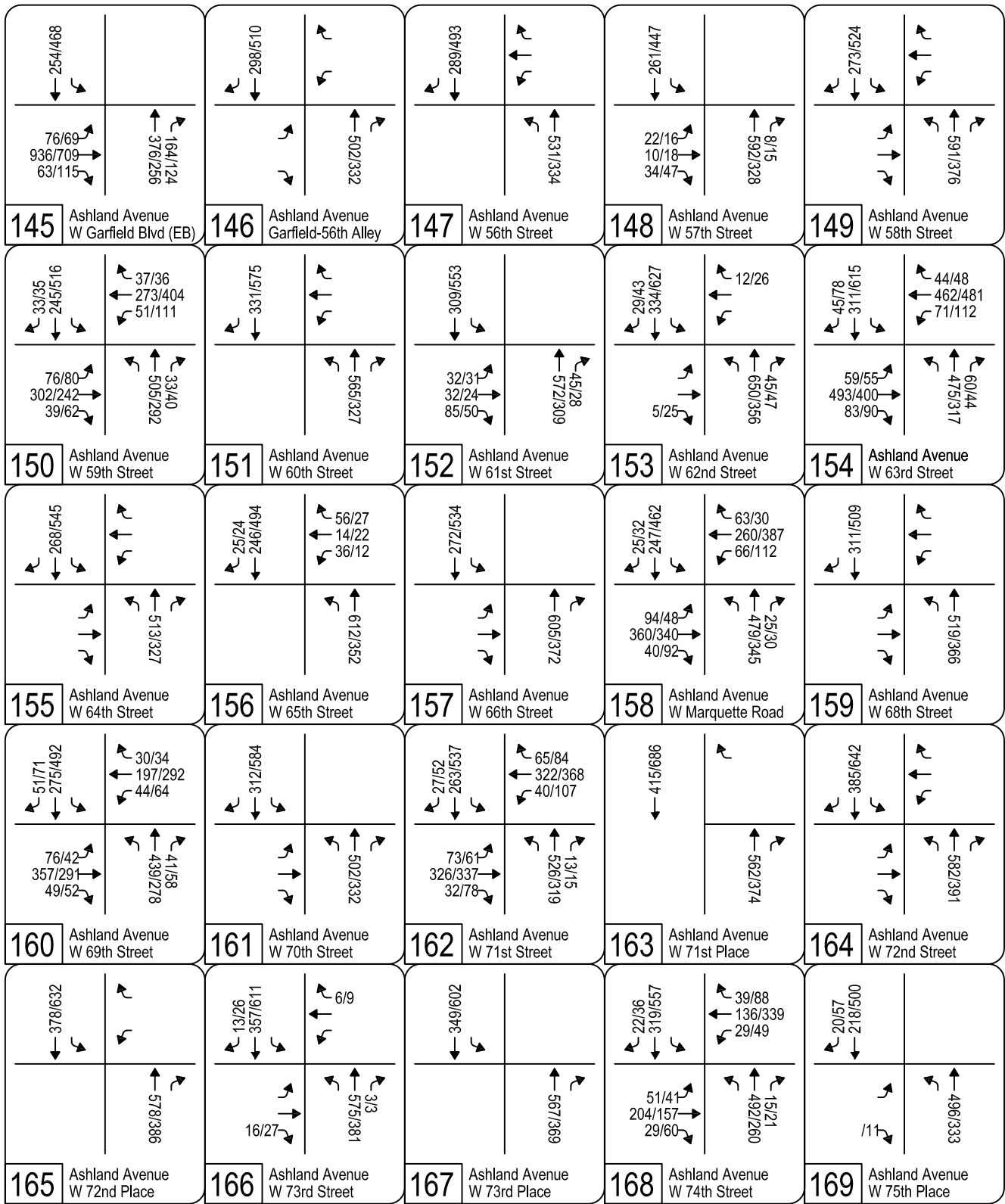
Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



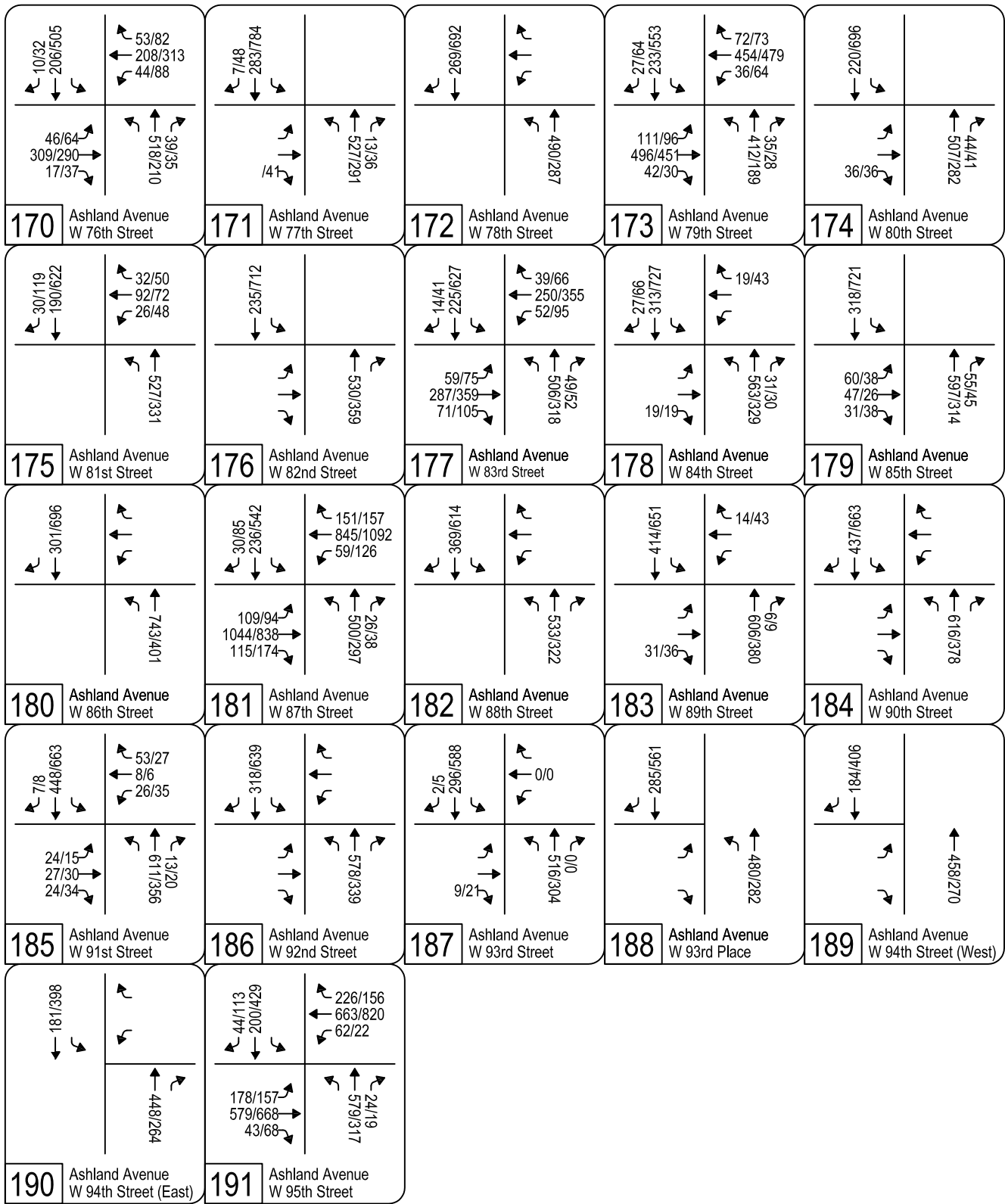
Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)



Build Conditions

Legend: AM/PM Peak Hour Volumes (vph)

Level of Service Results Tables

ID	Location	Existing Conditions AM	Existing Conditions PM	Build Conditions AM	Build Conditions PM	Build with Mitigations Conditions AM	Build with Mitigations Conditions PM	Build AM Change	Build PM Change	Build with Mitigations AM Change	Build with Mitigations PM Change
1001	W Irving Park Rd.	D 46.2	D 38.7	F 91.4	E 64.9	F 91.3	E 65.3	+45.2	+26.2	+45.1	+26.6
1003	W Grace St.	B 19.5	B 16.9	C 32.0	C 27.4	C 32.6	C 26.7	+12.5	+10.5	+13.1	+9.8
1005	W Addison St.	D 51.0	C 25.4	E 66.0	D 49.4	D 41.4	C 30.8	+15.0	+24.0	-9.6	+5.4
1007	W Roscoe St.	C 22.4	B 19.7	C 27.3	C 20.6	C 28.2	C 21.4	+4.9	+0.9	+5.8	+1.7
1009	W School St.	C 20.5	B 17.9	C 23.6	B 19.9	C 26.2	C 21.9	+3.1	+2.0	+5.7	+4.0
1011	W Belmont Ave./ N. Lincoln Ave.	F 128.2	F 84.8	F 162.7	F 127.3	F 80.9	E 65.2	+34.5	+42.5	-47.3	-19.6
1012	W Barry Ave.	B 15.8	B 18.3	C 22.4	D 38.1	C 22.8	D 38.9	+6.6	+19.8	+7.0	+20.6
1014	W Wellington Ave.	C 21.8	C 22.0	C 23.7	C 30.7	C 24.0	C 31.6	+1.9	+8.7	+2.2	+9.6
1018	W Diversey Pkwy.	F 131.7	F 115.6	F 225.1	F 225.6	F 153.6	F 159.1	+93.4	+110.0	+21.9	+43.5
1019	W Wrightwood Ave.	B 13.8	B 17.8	D 45.0	D 47.8	D 47.1	D 47.8	+31.2	+30.0	+33.3	+30.0
1023	W Fullerton Ave.	E 56.7	D 48.4	D 38.5	D 49.9	D 38.3	D 51.4	-18.2	+1.5	-18.4	+3.0
1024	N Clybourn Ave.	E 74.9	E 73.5	E 60.7	D 48.7	D 48.7	D 48.1	-14.2	-24.8	-26.2	-25.4
1025	W Webster Ave.	C 21.3	C 23.2	C 30.5	E 72.5	C 23.0	D 44.6	+9.2	+49.3	+1.7	+21.4
1026	N Elston Ave.	E 76.6	C 33.7	D 50.9	C 27.7	D 51.8	C 28.2	-25.7	-6.0	-24.8	-5.5
1027	W Armitage Ave.	D 41.3	D 37.9	D 40.1	E 62.2	D 40.1	E 62.1	-1.2	+24.3	-1.2	+24.2
1029	W Cortland St.	B 18.4	C 20.4	E 61.5	E 68.0	E 61.5	E 68.0	+43.1	+47.6	+43.1	+47.6
1030	W Wabansia Ave.	A 8.1	A 5.7	B 12.6	B 10.0	B 12.6	B 10.0	+4.5	+4.3	+4.5	+4.3
1033	W North Ave.	D 40.9	D 39.2	D 42.0	E 59.6	D 42.0	E 59.8	+1.1	+20.4	+1.1	+20.6
1039	W Blackhawk St.	B 15.3	B 17.3	B 14.3	B 14.2	B 14.4	B 14.4	-1.0	-3.1	-0.9	-2.9
1042	N Milwaukee Ave.	C 27.5	C 29.6	C 30.3	C 32.1	C 30.3	C 32.1	+2.8	+2.5	+2.8	+2.5
1043	W Division St.	C 21.6	C 22.9	C 27.7	C 31.4	C 28.1	C 30.8	+6.1	+8.5	+6.5	+7.9
1049	W Augusta Blvd.	B 17.8	C 20.6	C 33.6	F 102.9	C 26.5	D 50.5	+15.8	+82.3	+8.7	+29.9
1056	W Chicago Ave.	C 22.3	C 28.9	B 16.5	C 22.1	B 16.5	C 22.1	-5.8	-6.8	-5.8	-6.8
1062	W Erie St.	A 9.7	A 8.3	B 12.7	B 13.0	B 12.7	B 13.0	+3.0	+4.7	+3.0	+4.7
1066	W Grand Ave.	C 26.9	C 29.4	C 26.5	C 29.7	C 26.5	C 29.7	-0.4	+0.3	-0.4	+0.3
1073	W Fulton St. (West)	B 10.8	B 10.4	A 9.2	B 14.4	A 9.2	B 14.4	-1.6	+4.0	-1.6	+4.0
1074	W Fulton St. (East)	A 2.3	A 4.1	A 5.1	A 7.7	A 5.1	A 7.7	+2.8	+3.6	+2.8	+3.6
1077	W Lake St.	B 13.2	B 15.7	C 22.5	C 23.3	C 22.5	C 23.3	+9.3	+7.6	+9.3	+7.6
1079	W Washington Blvd.	A 9.7	A 8.9	A 7.8	B 10.4	A 7.8	B 10.4	-1.9	+1.5	-1.9	+1.5
1080	W Warren Blvd.	A 7.3	A 5.4	B 13.7	B 15.7	B 13.7	B 15.7	+6.4	+10.3	+6.4	+10.3
1082	W Madison St.	B 15.0	B 14.7	B 14.6	C 20.1	B 14.6	C 20.1	-0.4	+5.4	-0.4	+5.4
1083	W Ogden Ave.	C 23.9	C 24.5	C 20.8	B 15.7	C 23.0	B 16.9	-3.1	-8.8	-0.9	-7.6
1084	W Monroe St.	A 5.9	A 6.5	A 7.8	A 8.6	A 7.8	A 8.6	+1.9	+2.1	+1.9	+2.1
1085	W Adams St.	B 18.5	B 19.0	B 11.1	B 10.6	B 11.0	B 10.6	-7.4	-8.4	-7.5	-8.4
1086	W Jackson Blvd.	B 15.5	B 16.0	B 12.5	B 12.5	B 11.0	B 11.8	-3.0	-3.5	-4.5	-4.2
1088	W Van Buren St.	F 94.4	B 18.7	E 59.7	C 32.8	D 51.1	D 38.5	-34.7	+14.1	-43.3	+19.8
1089	W Congress Pkwy	B 15.2	B 14.4	D 36.0	D 37.4	D 36.0	D 39.9	+20.8	+23.0	+20.8	+25.5
1090	W Harrison St.	B 12.8	B 15.5	B 18.3	C 24.5	B 18.4	C 24.1	+5.5	+9.0	+5.6	+8.6
1091	W Flournoy St.	A 6.8	A 8.2	A 9.8	B 12.2	A 9.8	B 12.2	+3.0	+4.0	+3.0	+4.0
1092	W Polk St.	B 11.4	C 24.3	B 11.9	B 19.7	B 11.9	B 19.9	+0.5	-4.6	+0.5	-4.4
1093	W Taylor St.	B 12.3	B 14.3	B 13.6	B 19.8	B 13.6	B 19.6	+1.3	+5.5	+1.3	+5.3
1094	W Roosevelt Rd.	E 59.7	D 50.3	D 46.6	E 61.5	D 44.1	D 49.1	-13.1	+11.2	-15.6	-1.2
1096	W 13th St.	A 4.1	A 7.7	A 5.7	C 29.9	A 5.7	C 29.2	+1.6	+22.2	+1.6	+21.5

1098 W 14th St.	B	15.2	B	14.3	B	18.7	B	14.6	B	18.8	B	14.6	+3.5	+0.3	+3.6	+0.3
1103 W 18th St.	C	22.0	C	21.0	D	42.2	D	38.2	D	42.2	D	38.2	+20.2	+17.2	+20.2	+17.2
1105 W 19th St.	B	12.5	B	12.4	C	26.0	B	16.5	C	26.0	B	16.5	+13.5	+4.1	+13.5	+4.1
1107 W 21st St.	C	23.3	B	18.2	C	22.9	C	22.8	C	23.1	C	23.5	-0.4	+4.6	-0.2	+5.3
1109 W Cermak Rd.	E	68.1	D	51.5	F	145.6	F	115.4	F	127.1	F	96.3	+77.5	+63.9	+59.0	+44.8
1110 2451 S Ashland Ave.	A	2.2	A	1.8	A	2.6	A	2.2	A	2.6	A	2.3	+0.4	+0.4	+0.4	+0.5
1111 W 27th St.	A	1.7	A	2.1	A	1.9	A	0.9	A	1.9	A	0.9	+0.2	-1.2	+0.2	-1.2
1112 W Marketplace Access Rd.	A	5.2	A	3.1	A	9.8	A	8.0	A	9.8	A	8.0	+4.6	+4.9	+4.6	+4.9
1113 W 31st Pl.	B	19.3	B	19.0	D	37.4	C	29.5	D	37.4	C	29.5	+18.1	+10.5	+18.1	+10.5
1114 S Archer Ave.	C	26.6	C	24.7	C	28.2	C	29.4	C	28.2	C	29.4	+1.6	+4.7	+1.6	+4.7
1115 W Robinson St.	A	4.0	A	8.5	A	4.8	B	11.4	A	4.8	B	11.4	+0.8	+2.9	+0.8	+2.9
1118 W 33rd St.	A	6.1	B	18.9	B	10.6	B	11.1	B	10.6	B	11.1	+4.5	-7.8	+4.5	-7.8
1121 W 35th St.	C	22.9	B	18.2	C	20.7	C	25.5	C	20.7	C	25.5	-2.2	+7.3	-2.2	+7.3
1123 W 37th St.	A	5.8	A	4.0	B	10.4	A	6.6	B	10.4	A	6.6	+4.6	+2.6	+4.6	+2.6
1127 W Pershing Rd.	C	20.7	C	21.1	C	24.0	C	23.0	C	24.0	C	23.0	+3.3	+1.9	+3.3	+1.9
1130 W 42nd St. (West)	A	6.0	A	8.6	A	9.0	A	8.5	A	9.0	A	8.5	+3.0	-0.1	+3.0	-0.1
1131 W 42nd Pl.	A	6.5	A	2.8	A	7.3	A	4.3	A	7.3	A	4.3	+0.8	+1.5	+0.8	+1.5
1132 W 43rd St.	B	16.1	B	15.3	B	19.0	B	19.9	B	19.0	B	19.9	+2.9	+4.6	+2.9	+4.6
1133 W 44th St.	A	5.3	A	5.2	A	8.8	A	9.1	A	8.8	A	9.1	+3.5	+3.9	+3.5	+3.9
1134 W 45th St.	B	12.3	A	8.6	B	12.9	B	10.7	B	12.9	B	10.7	+0.6	+2.1	+0.6	+2.1
1135 W 46th St.	B	12.4	A	8.3	B	12.5	B	12.5	B	12.5	B	12.5	+0.1	+4.2	+0.1	+4.2
1136 W 47th St./ S. McDowell Ave.	C	22.2	B	19.0	C	20.6	B	18.8	C	20.6	B	18.8	-1.6	-0.2	-1.6	-0.2
1137 W 48th St.	A	6.7	A	8.0	B	14.2	D	38.6	B	14.2	D	38.6	+7.5	+30.6	+7.5	+30.6
1138 W 49th St.	A	7.0	A	7.8	B	12.6	A	9.4	B	12.6	A	9.4	+5.6	+1.6	+5.6	+1.6
1139 W 50th St.	A	8.2	A	7.5	B	10.8	B	11.4	B	10.8	B	11.4	+2.6	+3.9	+2.6	+3.9
1140 W 51st St.	B	19.5	C	20.0	B	18.4	B	17.2	B	18.4	B	17.2	-1.1	-2.8	-1.1	-2.8
1142 W 53rd St.	A	4.2	B	11.1	A	6.3	B	11.6	A	6.3	B	11.6	+2.1	+0.5	+2.1	+0.5
1144 W Garfield Blvd. (WB)	B	17.3	B	17.9	C	21.7	C	25.7	C	21.7	C	25.7	+4.4	+7.8	+4.4	+7.8
1145 W Garfield Blvd. (EB)	B	19.9	C	26.4	C	30.1	C	22.3	C	30.1	C	22.3	+10.2	-4.1	+10.2	-4.1
1148 W 57th St.	B	10.9	A	5.5	B	12.2	B	11.7	B	12.2	B	11.7	+1.3	+6.2	+1.3	+6.2
1150 W 59th St.	B	16.6	B	14.0	C	24.3	C	24.7	C	24.3	C	24.7	+7.7	+10.7	+7.7	+10.7
1152 W 61st St.	A	8.7	B	11.8	B	19.0	B	15.5	B	19.0	B	15.5	+10.3	+3.7	+10.3	+3.7
1154 W 63rd St.	C	31.2	C	27.3	B	18.2	C	21.3	B	18.2	C	21.3	-13.0	-6.0	-13.0	-6.0
1156 W 65th St.	A	3.1	A	1.9	A	8.5	A	5.8	A	8.5	A	5.8	+5.4	+3.9	+5.4	+3.9
1158 W Marquette Rd.	C	20.7	C	33.3	C	30.7	C	33.3	C	30.7	C	33.3	+10.0	+0.0	+10.0	+0.0
1160 W 69th St.	B	17.2	B	19.0	C	21.8	C	25.3	C	21.8	C	25.3	+4.6	+6.3	+4.6	+6.3
1162 W 71st St.	C	21.5	B	17.3	C	24.2	C	24.4	C	24.2	C	24.4	+2.7	+7.1	+2.7	+7.1
1168 W 74th St.	B	10.7	B	14.4	B	17.1	C	20.7	B	17.1	C	20.7	+6.4	+6.3	+6.4	+6.3
1170 W 76th St.	B	17.0	B	12.3	C	20.9	C	20.4	C	20.9	C	20.4	+3.9	+8.1	+3.9	+8.1
1173 W 79th St.	C	30.0	C	24.3	C	33.7	D	52.8	C	33.7	D	52.8	+3.7	+28.5	+3.7	+28.5
1175 W 81st St.	A	5.9	A	8.5	B	15.1	D	54.6	B	15.1	D	54.6	+9.2	+46.1	+9.2	+46.1
1177 W 83rd St.	B	14.7	C	22.4	B	19.6	C	28.6	B	19.6	C	28.6	+4.9	+6.2	+4.9	+6.2
1179 W 85th St.	B	10.1	A	5.6	B	12.8	B	10.8	B	12.8	B	10.8	+2.7	+5.2	+2.7	+5.2
1181 W 87th St.	D	44.9	C	33.5	D	38.1	D	50.5	D	38.1	D	50.5	-6.8	+17.0	-6.8	+17.0
1185 W 91st St.	A	8.0	A	5.1	B	13.8	B	11.7	B	13.8	B	11.7	+5.8	+6.6	+5.8	+6.6
1191 W 95th St.	D	38.3	C	34.4	D	43.8	C	28.8	D	43.8	C	28.8	+5.5	-5.6	+5.5	-5.6

Existing Level of Service Reports

HCM Signalized Intersection Capacity Analysis
 1001: Ashland Ave. □ W Irving Park Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑		↘	↑↑	↗	↘	↑↑	↗
Volume (vph)	215	843	133	127	826	39	106	790	100	78	932	139
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	12	10	9	13	10	9
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.79	1.00	0.99		1.00	1.00	0.67	1.00	1.00	0.85
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1559	3040	1074	1544	3101		1674	2691	603	1732	3002	1000
Flt Permitted	0.13	1.00	1.00	0.14	1.00		0.12	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	210	3040	1074	232	3101		216	2691	603	343	3002	1000
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	236	926	146	140	908	43	116	868	110	86	1024	153
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	236	926	146	140	951	0	116	868	110	86	1024	153
Confl. Peds. (#/hr)	239		202	202		239	144		378	378		144
Confl. Bikes (#/hr)						1						3
Heavy Vehicles (%)	2%	5%	5%	3%	1%	3%	2%	2%	6%	1%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								36	36		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	37.2	31.2	31.2	36.8	31.0		38.1	32.7	32.7	35.9	31.6	31.6
Effective Green, g (s)	37.2	31.2	31.2	36.8	31.0		38.1	32.7	32.7	35.9	31.6	31.6
Actuated g/C Ratio	0.41	0.35	0.35	0.41	0.34		0.42	0.36	0.36	0.40	0.35	0.35
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	176	1053	372	179	1068		178	977	219	203	1054	351
v/s Ratio Prot	c0.09	0.30		0.05	0.31		c0.04	0.32		0.02	c0.34	
v/s Ratio Perm	c0.46		0.14	0.27			0.24		0.18	0.15		0.15
v/c Ratio	1.34	0.88	0.39	0.78	0.89		0.65	0.89	0.50	0.42	0.97	0.44
Uniform Delay, d1	22.1	27.6	22.2	19.4	27.9		19.1	26.9	22.3	18.3	28.8	22.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.71	0.84	0.78	1.00	1.00	1.00
Incremental Delay, d2	186.5	10.5	3.1	18.3	11.2		4.5	8.7	5.7	0.5	21.7	3.9
Delay (s)	208.5	38.1	25.3	37.7	39.1		18.1	31.4	23.1	18.8	50.4	26.3
Level of Service	F	D	C	D	D		B	C	C	B	D	C
Approach Delay (s)		67.4			38.9			29.1			45.3	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1003: Ashland Ave. □ W Grace St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕↔		↕	↕↔	
Volume (vph)	56	74	46	0	0	0	25	994	50	32	1281	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	12	10	10	11	10	10
Total Lost time (s)		4.0					4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99					1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.98					1.00	1.00		1.00	1.00	
Frt		0.96					1.00	0.99		1.00	1.00	
Flt Protected		0.98					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1459					1710	2551		1517	2670	
Flt Permitted		0.98					0.12	1.00		0.19	1.00	
Satd. Flow (perm)		1459					216	2551		302	2670	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	62	81	51	0	0	0	27	1092	55	35	1408	15
RTOR Reduction (vph)	0	14	0	0	0	0	0	4	0	0	1	0
Lane Group Flow (vph)	0	180	0	0	0	0	27	1143	0	35	1422	0
Confl. Peds. (#/hr)	62		25	25		62	16		19	19		16
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	4%	0%	0%	0%	0%	0%	4%	2%	9%	2%	0%
Parking (#/hr)								44			38	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0					56.0	56.0		56.0	56.0	
Effective Green, g (s)		26.0					56.0	56.0		56.0	56.0	
Actuated g/C Ratio		0.29					0.62	0.62		0.62	0.62	
Clearance Time (s)		4.0					4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		421					134	1587		187	1661	
v/s Ratio Prot								0.45			c0.53	
v/s Ratio Perm		0.12					0.13			0.12		
v/c Ratio		0.43					0.20	0.72		0.19	0.86	
Uniform Delay, d1		26.0					7.3	11.6		7.3	13.7	
Progression Factor		1.00					2.18	2.18		0.31	0.61	
Incremental Delay, d2		3.1					2.7	2.3		1.3	3.6	
Delay (s)		29.1					18.8	27.8		3.5	11.9	
Level of Service		C					B	C		A	B	
Approach Delay (s)		29.1			0.0			27.6			11.7	
Approach LOS		C			A			C			B	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1005: Ashland Ave. □ W Addison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	162	501	62	131	472	30	37	700	94	87	1182	91
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	10	10	9	10	12	10	10	12	10	10
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.94	1.00	1.00	0.87
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1524	1500	1395	1433	1558	1249	1629	2569	795	1645	2696	876
Flt Permitted	0.33	1.00	1.00	0.30	1.00	1.00	0.11	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	522	1500	1395	451	1558	1249	185	2569	795	432	2696	876
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	178	551	68	144	519	33	41	769	103	96	1299	100
RTOR Reduction (vph)	0	0	6	0	0	9	0	0	31	0	0	18
Lane Group Flow (vph)	178	551	62	144	519	24	41	769	72	96	1299	82
Confl. Peds. (#/hr)	28		11	11		28	49		16	16		49
Confl. Bikes (#/hr)			2			1			1			2
Heavy Vehicles (%)	0%	8%	0%	11%	4%	10%	5%	5%	17%	3%	3%	5%
Parking (#/hr)								42	42		32	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	44.0	44.0	44.0	44.0	44.0	44.0	37.0	37.0	37.0	37.0	37.0	37.0
Effective Green, g (s)	44.0	44.0	44.0	44.0	44.0	44.0	37.0	37.0	37.0	37.0	37.0	37.0
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	255	733	682	220	761	610	76	1056	326	177	1108	360
v/s Ratio Prot		c0.37			0.33			0.30			c0.48	
v/s Ratio Perm	0.34		0.04	0.32		0.02	0.22		0.09	0.22		0.09
v/c Ratio	0.70	0.75	0.09	0.65	0.68	0.04	0.54	0.73	0.22	0.54	1.17	0.23
Uniform Delay, d1	17.8	18.6	12.3	17.3	17.6	12.0	20.1	22.3	17.2	20.1	26.5	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.74	0.99
Incremental Delay, d2	14.7	7.0	0.3	14.2	4.9	0.1	24.8	4.4	1.6	6.3	83.1	0.8
Delay (s)	32.6	25.6	12.6	31.5	22.5	12.1	44.8	26.7	18.7	24.2	102.6	17.9
Level of Service	C	C	B	C	C	B	D	C	B	C	F	B
Approach Delay (s)		26.0			23.9			26.6			91.9	
Approach LOS		C			C			C			F	

Intersection Summary

HCM 2000 Control Delay	51.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1007: Ashland Ave. □ W Roscoe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕			↕	↕
Volume (vph)	0	0	0	89	185	64	15	928	0	0	1251	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	10	10	10	10	10
Total Lost time (s)					4.0		4.0	4.0			4.0	4.0
Lane Util. Factor					1.00		1.00	0.95			0.95	1.00
Frbp, ped/bikes					0.99		1.00	1.00			1.00	0.91
Flpb, ped/bikes					1.00		1.00	1.00			1.00	1.00
Frt					0.97		1.00	1.00			1.00	0.85
Flt Protected					0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)					1639		1653	2816			2597	821
Flt Permitted					0.99		0.13	1.00			1.00	1.00
Satd. Flow (perm)					1639		229	2816			2597	821
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	98	203	70	16	1020	0	0	1375	81
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	0	16
Lane Group Flow (vph)	0	0	0	0	361	0	16	1020	0	0	1375	65
Confl. Peds. (#/hr)	43		13	13		43	20		18	18		20
Confl. Bikes (#/hr)			2			1						4
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	6%	0%	0%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								6			48	48
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					24.0		53.0	53.0			53.0	53.0
Effective Green, g (s)					24.0		53.0	53.0			53.0	53.0
Actuated g/C Ratio					0.28		0.62	0.62			0.62	0.62
Clearance Time (s)					4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)					462		142	1755			1619	511
v/s Ratio Prot								0.36			c0.53	
v/s Ratio Perm					0.22		0.07					0.08
v/c Ratio					0.78		0.11	0.58			0.85	0.13
Uniform Delay, d1					28.1		6.5	9.4			12.8	6.5
Progression Factor					1.00		2.06	2.26			1.00	1.00
Incremental Delay, d2					12.4		1.2	1.1			5.8	0.5
Delay (s)					40.4		14.5	22.4			18.6	7.1
Level of Service					D		B	C			B	A
Approach Delay (s)		0.0			40.4			22.3			17.9	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1009: Ashland Ave. □ W School St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	↗
Volume (vph)	122	228	19	14	8	10	8	912	17	61	1148	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	10	9
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	0.86
Flpb, ped/bikes		0.99			0.99		1.00	1.00		0.99	1.00	1.00
Frt		0.99			0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1608			1545		1653	2804		1635	2944	1007
Flt Permitted		0.88			0.85		0.14	1.00		0.22	1.00	1.00
Satd. Flow (perm)		1437			1335		250	2804		371	2944	1007
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	134	251	21	15	9	11	9	1002	19	67	1262	32
RTOR Reduction (vph)	0	2	0	0	7	0	0	2	0	0	0	10
Lane Group Flow (vph)	0	404	0	0	28	0	9	1019	0	67	1262	22
Confl. Peds. (#/hr)	24		35	35		24	33		24	24		33
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	2%	0%	5%	0%	0%	0%	0%	5%	6%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								22			0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		28.0			28.0		49.0	49.0		49.0	49.0	49.0
Effective Green, g (s)		28.0			28.0		49.0	49.0		49.0	49.0	49.0
Actuated g/C Ratio		0.33			0.33		0.58	0.58		0.58	0.58	0.58
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)		473			439		144	1616		213	1697	580
v/s Ratio Prot								0.36			c0.43	
v/s Ratio Perm		c0.28			0.02		0.04			0.18		0.02
v/c Ratio		0.85			0.06		0.06	0.63		0.31	0.74	0.04
Uniform Delay, d1		26.6			19.5		7.9	12.0		9.3	13.3	7.8
Progression Factor		1.00			1.00		1.00	1.00		1.07	1.31	1.02
Incremental Delay, d2		17.6			0.3		0.8	1.9		1.9	1.5	0.1
Delay (s)		44.2			19.8		8.7	13.9		11.9	19.0	8.0
Level of Service		D			B		A	B		B	B	A
Approach Delay (s)		44.2			19.8			13.8			18.4	
Approach LOS		D			B			B			B	

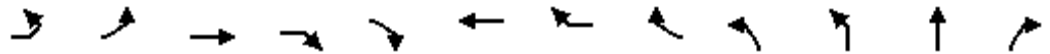
Intersection Summary

HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	EBL2	EBL	EBT	EBR	EBR2	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations			↔			↑	↔			↔	↑↑	↔
Volume (vph)	3	1	382	105	40	245	135	43	2	65	891	93
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	10	12	11	11	10	10
Total Lost time (s)			5.0			5.0	5.0			6.0	6.0	6.0
Lane Util. Factor			1.00			1.00	1.00			1.00	0.95	1.00
Frbp, ped/bikes			0.97			1.00	0.90			1.00	1.00	0.87
Flpb, ped/bikes			1.00			1.00	1.00			1.00	1.00	1.00
Frt			0.96			1.00	0.85			1.00	1.00	0.85
Flt Protected			1.00			1.00	1.00			0.95	1.00	1.00
Satd. Flow (prot)			1506			1706	1162			1493	2706	894
Flt Permitted			1.00			1.00	1.00			0.13	1.00	1.00
Satd. Flow (perm)			1503			1706	1162			203	2706	894
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	3	1	420	115	44	269	148	47	2	71	979	102
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	583	0	0	269	195	0	0	73	979	103
Confl. Peds. (#/hr)		42		51			42			26		47
Confl. Bikes (#/hr)				8								
Heavy Vehicles (%)	0%	0%	8%	7%	5%	2%	13%	5%	0%	11%	5%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)											24	24
Turn Type	Perm	Perm	NA			NA	Perm		Perm	Perm	NA	Perm
Protected Phases			10			14					2	
Permitted Phases	10	10					14		2	2		2
Actuated Green, G (s)			27.0			27.0	27.0			31.0	31.0	31.0
Effective Green, g (s)			27.0			27.0	27.0			31.0	31.0	31.0
Actuated g/C Ratio			0.27			0.27	0.27			0.31	0.31	0.31
Clearance Time (s)			5.0			5.0	5.0			6.0	6.0	6.0
Lane Grp Cap (vph)			405			460	313			62	838	277
v/s Ratio Prot						0.16					0.36	
v/s Ratio Perm			c0.39				0.17			0.36		0.12
v/c Ratio			1.44			0.58	0.62			1.18	1.17	0.37
Uniform Delay, d1			36.5			31.6	32.0			34.5	34.5	26.9
Progression Factor			1.00			1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2			211.4			5.4	9.0			170.2	88.5	3.8
Delay (s)			247.9			37.0	41.1			204.7	123.0	30.7
Level of Service			F			D	D			F	F	C
Approach Delay (s)			247.9			38.7					119.9	
Approach LOS			F			D					F	

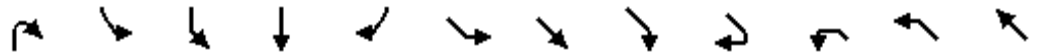
Intersection Summary

HCM 2000 Control Delay	128.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	136.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	NBR2	SBL2	SBL	SBT	SBR	SEL	SET	SER	SER2	NWL2	NWL	NWT
Lane Configurations			↔	↕		↔	↕				↔	↕
Volume (vph)	1	16	76	985	9	26	335	109	1	7	16	247
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	12	12	11	11	9	11	11	11	12	9	11
Total Lost time (s)			6.0	6.0		6.0	6.0				6.0	6.0
Lane Util. Factor			1.00	0.95		1.00	1.00				1.00	1.00
Frbp, ped/bikes			1.00	1.00		1.00	1.00				1.00	1.00
Flpb, ped/bikes			1.00	1.00		1.00	1.00				1.00	1.00
Frt			1.00	1.00		1.00	0.96				1.00	0.97
Flt Protected			0.95	1.00		0.95	1.00				0.95	1.00
Satd. Flow (prot)			1710	3071		1374	1623				1539	1662
Flt Permitted			0.13	1.00		0.30	1.00				0.16	1.00
Satd. Flow (perm)			232	3071		428	1623				259	1662
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1	18	84	1082	10	29	368	120	1	8	18	271
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	102	1092	0	29	489	0	0	0	26	343
Confl. Peds. (#/hr)			47		26							
Confl. Bikes (#/hr)												
Heavy Vehicles (%)	100%	0%	0%	2%	11%	12%	3%	4%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0								
Turn Type		Perm	Perm	NA		Perm	NA			Perm	Perm	NA
Protected Phases				6			4					8
Permitted Phases		6	6			4				8	8	
Actuated Green, G (s)			31.0	31.0		25.0	25.0				25.0	25.0
Effective Green, g (s)			31.0	31.0		25.0	25.0				25.0	25.0
Actuated g/C Ratio			0.31	0.31		0.25	0.25				0.25	0.25
Clearance Time (s)			6.0	6.0		6.0	6.0				6.0	6.0
Lane Grp Cap (vph)			71	952		107	405				64	415
v/s Ratio Prot				0.36			c0.30					0.21
v/s Ratio Perm			c0.44			0.07					0.10	
v/c Ratio			1.44	1.15		0.27	1.21				0.41	0.83
Uniform Delay, d1			34.5	34.5		30.2	37.5				31.3	35.4
Progression Factor			1.00	1.00		1.00	1.00				1.00	1.00
Incremental Delay, d2			259.6	78.6		6.1	114.4				18.0	17.0
Delay (s)			294.1	113.1		36.3	151.9				49.3	52.4
Level of Service			F	F		D	F				D	D
Approach Delay (s)				128.6			145.5					52.2
Approach LOS				F			F					D

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	NWR	NWR2
Lane Configurations		
Volume (vph)	63	3
Ideal Flow (vphpl)	1800	1800
Lane Width	11	11
Total Lost time (s)		
Lane Util. Factor		
Frbp, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	69	3
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	3%	0%
Bus Blockages (#/hr)	0	0
Parking (#/hr)		
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 1012: Ashland Ave. □ W Barry Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↑↑			↑↑	↕
Volume (vph)	0	0	0	143	126	5	55	982	0	0	1094	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	16	16	16	11	11	10	11	11	10
Total Lost time (s)					4.0		4.0	4.0			4.0	4.0
Lane Util. Factor					1.00		1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00		1.00	1.00			1.00	0.81
Flpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Frt					1.00		1.00	1.00			1.00	0.85
Flt Protected					0.97		0.95	1.00			1.00	1.00
Satd. Flow (prot)					1930		1653	2812			2808	818
Flt Permitted					0.97		0.17	1.00			1.00	1.00
Satd. Flow (perm)					1930		299	2812			2808	818
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	157	138	5	60	1079	0	0	1202	81
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	25
Lane Group Flow (vph)	0	0	0	0	299	0	60	1079	0	0	1202	56
Confl. Peds. (#/hr)	54		19	19		54	48		130	130		48
Confl. Bikes (#/hr)						2			1			1
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%	0%	7%	0%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								16			30	30
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					25.0		52.0	52.0			52.0	52.0
Effective Green, g (s)					25.0		52.0	52.0			52.0	52.0
Actuated g/C Ratio					0.29		0.61	0.61			0.61	0.61
Clearance Time (s)					4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)					567		182	1720			1717	500
v/s Ratio Prot								0.38			c0.43	
v/s Ratio Perm					0.16		0.20					0.07
v/c Ratio					0.53		0.33	0.63			0.70	0.11
Uniform Delay, d1					25.1		8.0	10.4			11.2	6.9
Progression Factor					1.00		1.12	1.33			1.00	1.00
Incremental Delay, d2					3.5		4.3	1.6			2.4	0.5
Delay (s)					28.6		13.3	15.4			13.6	7.3
Level of Service					C		B	B			B	A
Approach Delay (s)		0.0			28.6			15.3			13.2	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1014: Ashland Ave. □ W Wellington Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↑↑	↕	↕	↑↑	
Volume (vph)	51	125	112	0	0	0	38	800	54	19	1056	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	10	9	11	10	9
Total Lost time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00					1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.99					1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00					1.00	1.00	1.00	1.00	1.00	
Frt		0.95					1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1658					1605	2571	1067	1652	2842	
Flt Permitted		0.99					0.18	1.00	1.00	0.28	1.00	
Satd. Flow (perm)		1658					299	2571	1067	482	2842	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	56	137	123	0	0	0	42	879	59	21	1160	22
RTOR Reduction (vph)	0	27	0	0	0	0	0	0	21	0	2	0
Lane Group Flow (vph)	0	289	0	0	0	0	42	879	38	21	1180	0
Confl. Peds. (#/hr)	8		1	1			8	2	1	1		2
Heavy Vehicles (%)	2%	2%	0%	0%	0%	0%	3%	13%	0%	0%	4%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								16	16		8	
Turn Type	Perm	NA					Perm	NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2		2	6		
Actuated Green, G (s)		25.0					52.0	52.0	52.0	52.0	52.0	
Effective Green, g (s)		25.0					52.0	52.0	52.0	52.0	52.0	
Actuated g/C Ratio		0.29					0.61	0.61	0.61	0.61	0.61	
Clearance Time (s)		4.0					4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		487					182	1572	652	294	1738	
v/s Ratio Prot								0.34			c0.42	
v/s Ratio Perm		0.17					0.14		0.04	0.04		
v/c Ratio		0.59					0.23	0.56	0.06	0.07	0.68	
Uniform Delay, d1		25.7					7.5	9.7	6.6	6.7	11.0	
Progression Factor		1.00					1.69	1.91	2.50	1.84	1.82	
Incremental Delay, d2		5.3					2.1	1.0	0.1	0.3	1.6	
Delay (s)		30.9					14.7	19.6	16.8	12.6	21.6	
Level of Service		C					B	B	B	B	C	
Approach Delay (s)		30.9			0.0			19.3			21.4	
Approach LOS		C			A			B			C	
Intersection Summary												
HCM 2000 Control Delay			21.8				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)				8.0	
Intersection Capacity Utilization			63.9%				ICU Level of Service				B	
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 1018: Ashland Ave. □ W Diversey Pkwy.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	683	75	132	449	64	12	968	116	80	1838	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	10	10	9	12	12	12	11	11	11
Total Lost time (s)	3.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1532	1615	1271	1554	1647	1252	1710	3196	1276	1574	3203	
Flt Permitted	0.18	1.00	1.00	0.14	1.00	1.00	0.10	1.00	1.00	0.15	1.00	
Satd. Flow (perm)	289	1615	1271	226	1647	1252	176	3196	1276	241	3203	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	202	751	82	145	493	70	13	1064	127	88	2020	112
RTOR Reduction (vph)	0	0	7	0	0	34	0	0	26	0	5	0
Lane Group Flow (vph)	202	751	75	145	493	36	13	1064	101	88	2127	0
Confl. Peds. (#/hr)	44		31	31		44	76		20	20		76
Confl. Bikes (#/hr)			5			2			3			1
Heavy Vehicles (%)	4%	4%	3%	2%	2%	3%	0%	7%	11%	5%	1%	4%
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	38.0	38.0	38.0	29.0	29.0	29.0	41.0	41.0	41.0	39.0	39.0	
Effective Green, g (s)	38.0	38.0	38.0	29.0	29.0	29.0	41.0	41.0	41.0	39.0	39.0	
Actuated g/C Ratio	0.45	0.45	0.45	0.34	0.34	0.34	0.48	0.48	0.48	0.46	0.46	
Clearance Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	4.0	4.0	
Lane Grp Cap (vph)	216	722	568	77	561	427	84	1541	615	110	1469	
v/s Ratio Prot	0.07	c0.46			0.30			0.33			c0.66	
v/s Ratio Perm	0.35		0.06	c0.64		0.03	0.07		0.08	0.36		
v/c Ratio	0.94	1.04	0.13	1.88	0.88	0.09	0.15	0.69	0.16	0.80	1.45	
Uniform Delay, d1	20.6	23.5	13.8	28.0	26.3	19.0	12.3	17.1	12.4	19.7	23.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.90	1.89	2.38	0.75	0.82	
Incremental Delay, d2	46.4	44.4	0.5	442.2	17.6	0.4	3.1	2.0	0.5	42.0	205.3	
Delay (s)	67.1	67.9	14.3	470.2	43.9	19.4	26.5	34.2	29.9	56.8	224.1	
Level of Service	E	E	B	F	D	B	C	C	C	E	F	
Approach Delay (s)		63.5			128.8			33.7			217.5	
Approach LOS		E			F			C			F	

Intersection Summary		
HCM 2000 Control Delay	131.7	HCM 2000 Level of Service F
HCM 2000 Volume to Capacity ratio	1.59	
Actuated Cycle Length (s)	85.0	Sum of lost time (s) 11.0
Intersection Capacity Utilization	119.7%	ICU Level of Service H
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1019: Ashland Ave. □ W Wrightwood Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻		↻	↕	↻	↻	↕	↻
Volume (vph)	31	188	97	102	107	14	31	1016	80	30	1284	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	9	9	9	9	12	11	10	10	11	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	2.0	2.0	2.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00		1.00	1.00	0.97	1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96			0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1533			1560		1605	3011	911	1653	3129	1359
Flt Permitted		0.95			0.59		0.11	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)		1466			940		185	3011	911	334	3129	1359
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	34	207	107	112	118	15	34	1116	88	33	1411	45
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	0	7
Lane Group Flow (vph)	0	348	0	0	242	0	34	1116	88	33	1411	38
Confl. Peds. (#/hr)	12		2	2		12	3		4	4		3
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	0%	0%	1%	1%	0%	0%	3%	6%	4%	0%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)									38			
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		27.0			27.0		50.0	50.0	50.0	52.0	52.0	52.0
Effective Green, g (s)		27.0			27.0		50.0	50.0	50.0	52.0	52.0	52.0
Actuated g/C Ratio		0.32			0.32		0.59	0.59	0.59	0.61	0.61	0.61
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	2.0	2.0	2.0
Lane Grp Cap (vph)		465			298		108	1771	535	204	1914	831
v/s Ratio Prot								0.37			c0.45	
v/s Ratio Perm		0.24			c0.26		0.18		0.10	0.10		0.03
v/c Ratio		0.75			0.81		0.31	0.63	0.16	0.16	0.74	0.05
Uniform Delay, d1		26.0			26.7		8.8	11.5	8.0	7.1	11.7	6.6
Progression Factor		1.00			1.00		1.00	1.00	1.00	0.33	0.30	0.19
Incremental Delay, d2		10.5			21.0		7.5	1.7	0.7	0.2	0.2	0.0
Delay (s)		36.5			47.7		16.3	13.2	8.6	2.5	3.7	1.3
Level of Service		D			D		B	B	A	A	A	A
Approach Delay (s)		36.5			47.7			12.9			3.6	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1023: Ashland Ave. □ W Fullerton Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖	↖		↖↗	↖	↖	↖↗	↖
Volume (vph)	123	594	7	165	445	14	0	873	81	30	1229	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	9	10	9	10	10	10	10	10	10
Total Lost time (s)	3.0	5.0		3.0	5.0	5.0		5.0	5.0	2.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.96		1.00	0.92	1.00	1.00	0.87
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1476	3035		1491	1631	1323		2804	1055	1492	2973	1079
Flt Permitted	0.18	1.00		0.25	1.00	1.00		1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	273	3035		397	1631	1323		2804	1055	279	2973	1079
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	135	653	8	181	489	15	0	959	89	33	1351	131
RTOR Reduction (vph)	0	1	0	0	0	10	0	0	44	0	0	44
Lane Group Flow (vph)	135	660	0	181	489	5	0	959	45	33	1351	87
Confl. Peds. (#/hr)	20		24	24		20	38		39	39		38
Confl. Bikes (#/hr)			5			1			2			3
Heavy Vehicles (%)	8%	5%	0%	3%	3%	0%	0%	7%	6%	7%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								4	4		0	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm		NA	custom	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2 10		1	6	
Permitted Phases	4			8		8			2	6		6
Actuated Green, G (s)	49.0	43.0		49.0	43.0	43.0		61.8	55.2	59.4	55.2	55.2
Effective Green, g (s)	49.0	43.0		49.0	43.0	43.0		59.8	55.2	59.4	55.2	55.2
Actuated g/C Ratio	0.38	0.33		0.38	0.33	0.33		0.46	0.42	0.46	0.42	0.42
Clearance Time (s)	3.0	5.0		3.0	5.0	5.0			5.0	2.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0			3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	158	1003		200	539	437		1289	447	166	1262	458
v/s Ratio Prot	0.04	0.22		c0.04	c0.30			c0.34		c0.01	c0.45	
v/s Ratio Perm	0.28			0.30		0.00			0.04	0.08		0.08
v/c Ratio	0.85	0.66		0.91	0.91	0.01		0.74	0.10	0.20	1.07	0.19
Uniform Delay, d1	37.0	37.2		38.0	41.6	29.2		28.8	22.5	21.7	37.4	23.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.97	1.75	1.00	1.00	1.00
Incremental Delay, d2	33.6	3.4		38.1	21.5	0.0		0.4	0.0	0.6	46.5	0.9
Delay (s)	70.6	40.6		76.0	63.1	29.3		28.2	39.3	22.3	83.9	24.3
Level of Service	E	D		E	E	C		C	D	C	F	C
Approach Delay (s)		45.7			65.8			29.2			77.4	
Approach LOS		D			E			C			E	

Intersection Summary		
HCM 2000 Control Delay	56.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.95	E
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	81.3%	17.0
Analysis Period (min)	15	ICU Level of Service
		D
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 1024: Medill Ave. □ Ashland Ave. □ N Clybourn Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations		↑	↔		↔		↔	↔		↔	↔	
Volume (vph)	3	528	176	18	190	42	44	972	56	157	1302	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	11	11	11	11	11	11	11	11	10	10	10
Total Lost time (s)		5.0	5.0		5.0		3.0	5.0		3.0	5.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.97		1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.97		1.00	0.99		1.00	1.00	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1740	1442		3052		1517	2855		1580	2923	
Flt Permitted		1.00	1.00		0.86		0.08	1.00		0.08	1.00	
Satd. Flow (perm)		1738	1442		2640		130	2855		129	2923	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	3	580	193	20	209	46	48	1068	62	173	1431	2
RTOR Reduction (vph)	0	0	0	0	11	0	0	3	0	0	51	0
Lane Group Flow (vph)	0	583	193	0	264	0	48	1127	0	173	1382	0
Confl. Peds. (#/hr)	2		14				2	35		4	4	
Heavy Vehicles (%)	0%	0%	0%	0%	5%	7%	9%	9%	7%	1%	2%	50%
Parking (#/hr)								0			6	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		59.0	59.0		59.0		55.4	49.0		60.6	51.6	
Effective Green, g (s)		59.0	59.0		59.0		55.4	49.0		60.6	51.6	
Actuated g/C Ratio		0.45	0.45		0.45		0.43	0.38		0.47	0.40	
Clearance Time (s)		5.0	5.0		5.0		3.0	5.0		3.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		788	654		1198		123	1076		160	1160	
v/s Ratio Prot							0.02	0.39		c0.07	c0.47	
v/s Ratio Perm		c0.34	0.13		0.10		0.15			0.43		
v/c Ratio		0.74	0.30		0.22		0.39	1.05		1.08	1.19	
Uniform Delay, d1		29.2	22.4		21.5		30.1	40.5		34.6	39.2	
Progression Factor		1.00	1.00		1.00		1.04	0.89		1.66	0.40	
Incremental Delay, d2		6.2	1.1		0.4		1.7	38.6		59.6	88.6	
Delay (s)		35.4	23.5		22.0		32.9	74.8		116.9	104.4	
Level of Service		D	C		C		C	E		F	F	
Approach Delay (s)		32.4			22.0			73.1			105.7	
Approach LOS		C			C			E			F	

Intersection Summary

HCM 2000 Control Delay	74.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	118.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	NEL
Lane Configurations	
Volume (vph)	0
Ideal Flow (vphpl)	1800
Lane Width	16
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Parking (#/hr)	
Turn Type	
Protected Phases	10
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	0.0
Approach LOS	A
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

1025: Ashland Ave. □ W Webster Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↕	↗	↖	↕	↗
Volume (vph)	48	223	3	152	223	12	9	820	122	10	1200	126
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	9	10	10
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99	1.00		0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1659	1406		3112		1596	2660	1191	1398	2879	
Flt Permitted		0.87	1.00		0.67		0.12	1.00	1.00	0.24	1.00	
Satd. Flow (perm)		1460	1406		2134		204	2660	1191	360	2879	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	53	245	3	167	245	13	10	901	134	11	1319	138
RTOR Reduction (vph)	0	0	2	0	3	0	0	0	66	0	12	0
Lane Group Flow (vph)	0	298	1	0	422	0	10	901	68	11	1445	0
Confl. Peds. (#/hr)	4		4	4		4	7		2	2		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	14%	2%	10%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								0	0		0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		24.0	24.0		24.0		33.0	33.0	33.0	33.0	33.0	
Effective Green, g (s)		24.0	24.0		24.0		33.0	33.0	33.0	33.0	33.0	
Actuated g/C Ratio		0.37	0.37		0.37		0.51	0.51	0.51	0.51	0.51	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		539	519		787		103	1350	604	182	1461	
v/s Ratio Prot								0.34			c0.50	
v/s Ratio Perm		c0.20	0.00		0.20		0.05		0.06	0.03		
v/c Ratio		0.55	0.00		0.54		0.10	0.67	0.11	0.06	0.99	
Uniform Delay, d1		16.2	12.9		16.1		8.3	11.9	8.4	8.1	15.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.23	1.44	
Incremental Delay, d2		4.0	0.0		2.6		1.9	2.6	0.4	0.1	4.9	
Delay (s)		20.3	12.9		18.7		10.2	14.5	8.7	10.1	27.7	
Level of Service		C	B		B		B	B	A	B	C	
Approach Delay (s)		20.2			18.7			13.8			27.5	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1026: Ashland Ave. □ N Elston Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	492	59	4	104	71	49	990	0	151	1325	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	16	16	12	10	14	14	10	10	10
Total Lost time (s)	4.0	4.0	4.0		4.0	3.0	4.0	4.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1647	1320		1925	1461	1535	3332		1520	3001	
Flt Permitted	0.65	1.00	1.00		0.77	1.00	0.12	1.00		0.12	1.00	
Satd. Flow (perm)	1091	1647	1320		1485	1461	196	3332		194	3001	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1	541	65	4	114	78	54	1088	0	166	1456	4
RTOR Reduction (vph)	0	0	46	0	0	37	0	0	0	0	0	0
Lane Group Flow (vph)	1	541	19	0	118	41	54	1088	0	166	1460	0
Confl. Peds. (#/hr)	9		10	10		9						
Heavy Vehicles (%)	0%	2%	2%	0%	6%	3%	4%	4%	0%	5%	1%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	31.0	31.0	31.0		31.0	41.0	53.0	53.0		43.0	43.0	
Effective Green, g (s)	31.0	31.0	31.0		31.0	41.0	53.0	53.0		43.0	43.0	
Actuated g/C Ratio	0.30	0.30	0.30		0.30	0.39	0.50	0.50		0.41	0.41	
Clearance Time (s)	4.0	4.0	4.0		4.0	3.0	4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	322	486	389		438	570	353	1681		205	1228	
v/s Ratio Prot		c0.33				0.01	0.03	c0.33		0.08	c0.49	
v/s Ratio Perm	0.00		0.01		0.08	0.02	0.05			0.25		
v/c Ratio	0.00	1.11	0.05		0.27	0.07	0.15	0.65		0.81	1.19	
Uniform Delay, d1	26.1	37.0	26.5		28.3	20.1	32.3	19.1		24.0	31.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.69	0.63		1.00	1.00	
Incremental Delay, d2	0.0	75.5	0.2		1.5	0.2	0.5	1.0		28.1	93.4	
Delay (s)	26.1	112.5	26.7		29.8	20.3	22.9	13.1		52.1	124.4	
Level of Service	C	F	C		C	C	C	B		D	F	
Approach Delay (s)		103.2			26.0			13.6			117.0	
Approach LOS		F			C			B			F	

Intersection Summary

HCM 2000 Control Delay	76.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1027: Ashland Ave. □ W Armitage Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘			↖			↖↗↘			↖↗	↘
Volume (vph)	462	409	57	3	182	0	30	612	0	0	971	353
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	10	10	16	16	16	10	10	10	11	11	10
Total Lost time (s)	3.0	5.0			5.0			4.0			4.0	3.0
Lane Util. Factor	1.00	1.00			1.00			0.91			0.95	1.00
Frbp, ped/bikes	1.00	1.00			1.00			1.00			1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.98			1.00			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			1.00	1.00
Satd. Flow (prot)	1541	1557			1943			3844			3210	1226
Flt Permitted	0.36	1.00			0.99			0.85			1.00	1.00
Satd. Flow (perm)	578	1557			1929			3280			3210	1226
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	508	449	63	3	200	0	33	673	0	0	1067	388
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	508	507	0	0	203	0	0	706	0	0	1067	388
Confl. Peds. (#/hr)	11		2	2			11	7		3	3	7
Heavy Vehicles (%)	7%	6%	4%	0%	5%	0%	10%	14%	0%	0%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	0	0
Parking (#/hr)								0				0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA			NA	custom
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2					16
Actuated Green, G (s)	42.0	42.0			20.0			41.0			54.0	54.0
Effective Green, g (s)	42.0	42.0			20.0			41.0			54.0	54.0
Actuated g/C Ratio	0.40	0.40			0.19			0.39			0.51	0.51
Clearance Time (s)	3.0	5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)	405	622			367			1280			1650	630
v/s Ratio Prot	c0.23	0.33									c0.33	
v/s Ratio Perm	c0.27				0.11			0.22				0.32
v/c Ratio	1.25	0.82			0.55			0.55			0.65	0.62
Uniform Delay, d1	28.6	28.0			38.5			24.9			18.6	18.1
Progression Factor	1.00	1.00			1.00			0.84			0.46	0.44
Incremental Delay, d2	133.3	11.3			5.9			1.5			0.2	0.4
Delay (s)	161.9	39.3			44.4			22.4			8.7	8.3
Level of Service	F	D			D			C			A	A
Approach Delay (s)		100.4			44.4			22.4			8.6	
Approach LOS		F			D			C			A	

Intersection Summary

HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1029: Ashland Ave. □ W Cortland St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↕			↑↑			↑↑	
Volume (vph)	1	275	20	98	121	4	0	697	86	0	1021	48
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frbp, ped/bikes		1.00	0.94		1.00			0.98			1.00	
Flpb, ped/bikes		1.00	1.00		0.99			1.00			1.00	
Frt		1.00	0.85		1.00			0.98			0.99	
Flt Protected		1.00	1.00		0.98			1.00			1.00	
Satd. Flow (prot)		1666	1364		1586			2346			3019	
Flt Permitted		1.00	1.00		0.65			1.00			1.00	
Satd. Flow (perm)		1666	1364		1048			2346			3019	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1	302	22	108	133	4	0	766	95	0	1122	53
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	303	22	0	244	0	0	861	0	0	1175	0
Confl. Peds. (#/hr)	159		27	27		159	28		52	52		28
Heavy Vehicles (%)	0%	8%	5%	6%	12%	0%	0%	8%	3%	0%	3%	0%
Parking (#/hr)								64			0	
Turn Type	Perm	NA	Perm	pm+pt	NA			NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		43.0	43.0		43.0			53.0			53.0	
Effective Green, g (s)		43.0	43.0		43.0			53.0			53.0	
Actuated g/C Ratio		0.41	0.41		0.41			0.50			0.50	
Clearance Time (s)		5.0	5.0		5.0			4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		682	558		429			1184			1523	
v/s Ratio Prot								0.37			c0.39	
v/s Ratio Perm		0.18	0.02		c0.23							
v/c Ratio		0.44	0.04		0.57			0.73			0.77	
Uniform Delay, d1		22.4	18.6		23.9			20.3			21.1	
Progression Factor		1.00	1.00		1.00			1.00			0.37	
Incremental Delay, d2		2.1	0.1		1.7			3.9			3.3	
Delay (s)		24.5	18.7		25.6			24.3			11.1	
Level of Service		C	B		C			C			B	
Approach Delay (s)		24.1			25.6			24.3			11.1	
Approach LOS		C			C			C			B	

Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1030: Ashland Ave. □ W Wabansia Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Volume (vph)	34	5	130	25	10	18	24	624	9	9	915	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	9	10	10	9
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.96			1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes		1.00			0.99		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.90			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1419			1119		1477	2568	994	1589	2944	1037
Flt Permitted		0.93			0.72		0.26	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1328			830		412	2568	994	642	2944	1037
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	37	5	143	27	11	20	26	686	10	10	1005	16
RTOR Reduction (vph)	0	96	0	0	17	0	0	0	2	0	0	3
Lane Group Flow (vph)	0	89	0	0	41	0	26	686	8	10	1005	13
Confl. Peds. (#/hr)	1		20	20		1	1		4	4		1
Heavy Vehicles (%)	0%	0%	1%	40%	0%	56%	8%	10%	0%	0%	3%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								26	26		0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		12.6			12.6		64.4	64.4	64.4	64.4	64.4	64.4
Effective Green, g (s)		12.6			12.6		64.4	64.4	64.4	64.4	64.4	64.4
Actuated g/C Ratio		0.15			0.15		0.76	0.76	0.76	0.76	0.76	0.76
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		5.0			5.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		196			123		312	1945	753	486	2230	785
v/s Ratio Prot								0.27			c0.34	
v/s Ratio Perm		c0.07			0.05		0.06		0.01	0.02		0.01
v/c Ratio		0.45			0.33		0.08	0.35	0.01	0.02	0.45	0.02
Uniform Delay, d1		33.1			32.4		2.7	3.4	2.5	2.5	3.8	2.5
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4			3.3		0.5	0.5	0.0	0.1	0.7	0.0
Delay (s)		36.5			35.8		3.2	3.9	2.5	2.6	4.5	2.6
Level of Service		D			D		A	A	A	A	A	A
Approach Delay (s)		36.5			35.8			3.9			4.4	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1033: Ashland Ave. □ W North Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕	↗	↖	↕	↗
Volume (vph)	64	537	33	90	386	19	62	706	91	190	1013	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	10	10	10	10	10	10
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1293	2661		1507	2999		1506	2415	895	1595	2619	849
Flt Permitted	0.41	1.00		0.28	1.00		0.11	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	554	2661		438	2999		179	2415	895	384	2619	849
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	70	590	36	99	424	21	68	776	100	209	1113	34
RTOR Reduction (vph)	0	5	0	0	4	0	0	0	52	0	0	20
Lane Group Flow (vph)	70	621	0	99	441	0	68	776	48	209	1113	14
Confl. Peds. (#/hr)			13	13			27		10	10		27
Heavy Vehicles (%)	19%	15%	6%	2%	2%	0%	6%	15%	11%	0%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								32	32		42	42
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	34.6	29.0		34.6	29.0		40.2	35.4	35.4	42.6	36.6	36.6
Effective Green, g (s)	34.6	29.0		34.6	29.0		40.2	35.4	35.4	42.6	36.6	36.6
Actuated g/C Ratio	0.38	0.32		0.38	0.32		0.45	0.39	0.39	0.47	0.41	0.41
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	258	857		234	966		150	949	352	262	1065	345
v/s Ratio Prot	0.02	c0.23		c0.03	0.15		0.02	0.32		c0.05	c0.43	
v/s Ratio Perm	0.09			0.14			0.18		0.05	0.32		0.02
v/c Ratio	0.27	0.72		0.42	0.46		0.45	0.82	0.14	0.80	1.05	0.04
Uniform Delay, d1	18.2	27.0		18.9	24.2		17.2	24.4	17.5	17.7	26.7	16.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	5.3		1.2	1.6		2.2	7.8	0.8	15.4	40.1	0.2
Delay (s)	18.8	32.3		20.1	25.8		19.4	32.2	18.3	33.1	66.8	16.3
Level of Service	B	C		C	C		B	C	B	C	E	B
Approach Delay (s)		30.9			24.8			29.8			60.3	
Approach LOS		C			C			C			E	

Intersection Summary

HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1039: Ashland Ave. □ W Blackhawk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	11	71	11	49	25	44	9	792	45	63	1077	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	11	11	11	9	10	10	9	10	10
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.95		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1946			1581		1533	2520		1503	2783	
Flt Permitted		0.97			0.87		0.14	1.00		0.24	1.00	
Satd. Flow (perm)		1907			1409		232	2520		379	2783	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	12	78	12	54	27	48	10	870	49	69	1184	24
RTOR Reduction (vph)	0	8	0	0	30	0	0	6	0	0	2	0
Lane Group Flow (vph)	0	94	0	0	99	0	10	913	0	69	1206	0
Confl. Peds. (#/hr)	24		9	9		24	19		9	9		19
Heavy Vehicles (%)	9%	0%	9%	0%	0%	2%	0%	5%	0%	2%	5%	9%
Parking (#/hr)								46				12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0			24.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)		24.0			24.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.37			0.37		0.54	0.54		0.54	0.54	
Clearance Time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		704			520		124	1356		204	1498	
v/s Ratio Prot								0.36			c0.43	
v/s Ratio Perm		0.05			c0.07		0.04			0.18		
v/c Ratio		0.13			0.19		0.08	0.67		0.34	0.80	
Uniform Delay, d1		13.6			13.9		7.2	10.9		8.5	12.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.8		1.3	2.7		4.4	4.7	
Delay (s)		14.0			14.7		8.5	13.5		12.9	16.9	
Level of Service		B			B		A	B		B	B	
Approach Delay (s)		14.0			14.7			13.5			16.7	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1042: Ashland Ave. □ N Milwaukee Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↑	↖	↖	↑↑	↖	↖	↗	↗
Volume (vph)	8	372	83	0	175	51	65	722	21	66	1051	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	11	11	11	10	10	8	10	11	11
Total Lost time (s)	5.0	5.0			5.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99			1.00	0.96	1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes	0.97	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1556	1602			1642	1285	1478	2956	1123	1516	3049	
Flt Permitted	0.64	1.00			1.00	1.00	0.11	1.00	1.00	0.35	1.00	
Satd. Flow (perm)	1043	1602			1642	1285	164	2956	1123	561	3049	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	9	409	91	0	192	56	71	793	23	73	1155	0
RTOR Reduction (vph)	0	9	0	0	0	35	0	0	11	0	0	0
Lane Group Flow (vph)	9	491	0	0	192	21	71	793	12	73	1155	0
Confl. Peds. (#/hr)	40		24	24		40	11		4	4		11
Heavy Vehicles (%)	0%	5%	5%	0%	6%	10%	8%	8%	0%	5%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA			NA	custom	pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2				6
Permitted Phases	4					3	2		2	6		
Actuated Green, G (s)	29.0	29.0			33.0	33.0	47.0	47.0	47.0	39.0	39.0	
Effective Green, g (s)	29.0	29.0			33.0	33.0	47.0	47.0	47.0	39.0	39.0	
Actuated g/C Ratio	0.32	0.32			0.37	0.37	0.52	0.52	0.52	0.43	0.43	
Clearance Time (s)	5.0	5.0			5.0		3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	336	516			602	471	158	1543	586	243	1321	
v/s Ratio Prot		c0.31			c0.12		0.02	c0.27			c0.38	
v/s Ratio Perm	0.01					0.02	0.21		0.01	0.13		
v/c Ratio	0.03	0.95			0.32	0.04	0.45	0.51	0.02	0.30	0.87	
Uniform Delay, d1	20.9	29.8			20.4	18.3	14.7	14.0	10.4	16.6	23.3	
Progression Factor	1.00	1.00			1.00	1.00	1.34	0.30	0.00	1.00	1.00	
Incremental Delay, d2	0.1	29.3			1.4	0.2	7.7	1.1	0.1	3.1	8.3	
Delay (s)	21.0	59.1			21.8	18.5	27.4	5.3	0.1	19.8	31.5	
Level of Service	C	E			C	B	C	A	A	B	C	
Approach Delay (s)		58.5			21.1			6.9			30.8	
Approach LOS		E			C			A			C	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1043: Ashland Ave. □ W Division St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑↗			↑↑	↗
Volume (vph)	117	657	54	128	335	42	41	818	147	2	926	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	10	9	11	9	11	11	9
Total Lost time (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91			0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.91	1.00	1.00	0.88	1.00	0.98			1.00	0.88
Flpb, ped/bikes	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1533	3179	1313	1646	3160	1262	1437	4047			3109	1050
Flt Permitted	0.53	1.00	1.00	0.22	1.00	1.00	0.12	1.00			0.95	1.00
Satd. Flow (perm)	859	3179	1313	389	3160	1262	186	4047			2964	1050
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	129	722	59	141	368	46	45	899	162	2	1018	78
RTOR Reduction (vph)	0	0	39	0	0	26	0	28	0	0	0	48
Lane Group Flow (vph)	129	722	20	141	368	20	45	1033	0	0	1020	30
Confl. Peds. (#/hr)	102		77	77		102	102		145	145		102
Confl. Bikes (#/hr)			7			1			1			1
Heavy Vehicles (%)	1%	4%	2%	0%	1%	0%	7%	6%	8%	0%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								10			0	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4	8		8	2		6			6
Actuated Green, G (s)	31.0	31.0	31.0	39.0	39.0	39.0	41.0	41.0			35.0	35.0
Effective Green, g (s)	31.0	31.0	31.0	39.0	39.0	39.0	41.0	41.0			35.0	35.0
Actuated g/C Ratio	0.34	0.34	0.34	0.43	0.43	0.43	0.46	0.46			0.39	0.39
Clearance Time (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	295	1094	452	238	1369	546	126	1843			1152	408
v/s Ratio Prot		c0.23		c0.03	0.12		0.01	c0.26				
v/s Ratio Perm	0.15		0.02	0.22		0.02	0.15				c0.34	0.03
v/c Ratio	0.44	0.66	0.04	0.59	0.27	0.04	0.36	0.56			0.89	0.07
Uniform Delay, d1	22.8	25.0	19.6	17.2	16.4	14.7	16.6	17.9			25.6	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			0.61	1.02
Incremental Delay, d2	4.7	3.1	0.2	10.4	0.5	0.1	1.7	1.2			4.9	0.2
Delay (s)	27.4	28.2	19.8	27.6	16.8	14.8	18.3	19.1			20.7	17.8
Level of Service	C	C	B	C	B	B	B	B			C	B
Approach Delay (s)		27.5			19.4			19.1			20.5	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1049: Ashland Ave. □ W Augusta Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↕		↖	↗	
Volume (vph)	161	424	52	28	218	28	34	663	46	52	968	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	9	10	9	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1561	1705		1477	1647	1154	1593	2565		1546	2662	
Flt Permitted	0.53	1.00		0.22	1.00	1.00	0.16	1.00		0.29	1.00	
Satd. Flow (perm)	875	1705		340	1647	1154	273	2565		475	2662	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	177	466	57	31	240	31	37	729	51	57	1064	60
RTOR Reduction (vph)	0	7	0	0	0	19	0	8	0	0	6	0
Lane Group Flow (vph)	177	516	0	31	240	12	37	772	0	57	1118	0
Confl. Peds. (#/hr)	34		6	6		34	6		20	20		6
Heavy Vehicles (%)	0%	0%	2%	4%	2%	14%	0%	11%	2%	2%	4%	2%
Parking (#/hr)								20				30
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	25.0	25.0		25.0	25.0	25.0	34.0	34.0		34.0	34.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0	25.0	34.0	34.0		34.0	34.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38	0.38	0.52	0.52		0.52	0.52	
Clearance Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	336	655		130	633	443	142	1341		248	1392	
v/s Ratio Prot		c0.30			0.15			0.30				c0.42
v/s Ratio Perm	0.20			0.09		0.01	0.14			0.12		
v/c Ratio	0.53	0.79		0.24	0.38	0.03	0.26	0.58		0.23	0.80	
Uniform Delay, d1	15.4	17.7		13.6	14.4	12.4	8.6	10.6		8.4	12.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	9.3		4.3	1.7	0.1	4.4	1.8		2.2	5.0	
Delay (s)	21.2	27.0		17.8	16.1	12.5	13.0	12.4		10.6	17.7	
Level of Service	C	C		B	B	B	B	B		B	B	
Approach Delay (s)		25.5			15.9			12.4			17.4	
Approach LOS		C			B			B			B	

Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1056: Ashland Ave. □ W Chicago Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	
Volume (vph)	114	502	67	37	383	19	79	601	42	37	1055	84
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	10	10	10	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1604	3126		1606	3219		1595	2779		1590	3062	
Flt Permitted	0.39	1.00		0.25	1.00		0.11	1.00		0.35	1.00	
Satd. Flow (perm)	661	3126		418	3219		189	2779		579	3062	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	125	552	74	41	421	21	87	660	46	41	1159	92
RTOR Reduction (vph)	0	14	0	0	5	0	0	4	0	0	5	0
Lane Group Flow (vph)	125	612	0	41	437	0	87	702	0	41	1246	0
Confl. Peds. (#/hr)	2		103	103		2	61		37	37		61
Heavy Vehicles (%)	3%	3%	1%	0%	2%	0%	0%	4%	0%	0%	1%	0%
Parking (#/hr)								14				0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.0	24.0		24.0	24.0		52.2	45.2		47.8	43.0	
Effective Green, g (s)	24.0	24.0		24.0	24.0		52.2	45.2		47.8	43.0	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.61	0.53		0.56	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	186	882		118	908		231	1477		382	1549	
v/s Ratio Prot		c0.20			0.14		c0.03	0.25		0.01	c0.41	
v/s Ratio Perm	0.19			0.10			0.20			0.05		
v/c Ratio	0.67	0.69		0.35	0.48		0.38	0.48		0.11	0.80	
Uniform Delay, d1	27.0	27.2		24.3	25.3		10.5	12.5		8.5	17.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	2.4		1.8	0.4		1.4	1.1		0.2	4.5	
Delay (s)	36.2	29.6		26.0	25.7		12.0	13.6		8.6	22.0	
Level of Service	D	C		C	C		B	B		A	C	
Approach Delay (s)		30.7			25.8			13.4			21.6	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1062: Ashland Ave. □ W Erie St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Volume (vph)	27	49	26	12	10	19	28	793	14	18	1150	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		5.0			5.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.98		1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes		0.99			1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt		0.97			0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1550			1415		1596	2759	1108	1584	2892	1112
Flt Permitted		0.92			0.92		0.16	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)		1450			1325		275	2759	1108	473	2892	1112
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	30	54	29	13	11	21	31	871	15	20	1264	15
RTOR Reduction (vph)	0	14	0	0	16	0	0	0	5	0	0	5
Lane Group Flow (vph)	0	99	0	0	29	0	31	871	10	20	1264	10
Confl. Peds. (#/hr)	15		12	12		15	3		10	10		3
Heavy Vehicles (%)	0%	4%	0%	8%	0%	11%	0%	7%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								10	10		14	14
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		23.0			23.0		59.0	59.0	59.0	59.0	59.0	59.0
Effective Green, g (s)		23.0			23.0		59.0	59.0	59.0	59.0	59.0	59.0
Actuated g/C Ratio		0.26			0.26		0.66	0.66	0.66	0.66	0.66	0.66
Clearance Time (s)		5.0			5.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		370			338		180	1808	726	310	1895	728
v/s Ratio Prot								0.32			c0.44	
v/s Ratio Perm		c0.07			0.02		0.11		0.01	0.04		0.01
v/c Ratio		0.27			0.09		0.17	0.48	0.01	0.06	0.67	0.01
Uniform Delay, d1		26.8			25.5		6.0	7.8	5.4	5.6	9.5	5.4
Progression Factor		1.00			1.00		0.53	0.47	0.15	1.00	1.00	1.00
Incremental Delay, d2		1.8			0.5		1.7	0.8	0.0	0.4	1.9	0.0
Delay (s)		28.5			26.0		4.9	4.4	0.9	6.0	11.4	5.4
Level of Service		C			C		A	A	A	A	B	A
Approach Delay (s)		28.5			26.0			4.4			11.2	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1066: Ashland Ave. □ W Grand Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Volume (vph)	86	734	174	56	315	35	75	667	63	90	912	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	1.00	0.89
Flpb, ped/bikes	0.99	1.00		0.98	1.00		0.98	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1504	2878		1496	2898		1408	2656		1565	2973	1059
Flt Permitted	0.42	1.00		0.19	1.00		0.24	1.00		0.21	1.00	1.00
Satd. Flow (perm)	663	2878		304	2898		349	2656		343	2973	1059
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	95	807	191	62	346	38	82	733	69	99	1002	57
RTOR Reduction (vph)	0	23	0	0	9	0	0	8	0	0	0	24
Lane Group Flow (vph)	95	975	0	62	375	0	82	794	0	99	1002	33
Confl. Peds. (#/hr)	41		61	61		41	58		16	16		58
Heavy Vehicles (%)	5%	6%	5%	5%	8%	6%	11%	8%	10%	2%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								14			0	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	37.6	37.6		29.8	29.8		35.8	35.8		44.4	44.4	44.4
Effective Green, g (s)	37.6	37.6		29.8	29.8		35.8	35.8		44.4	44.4	44.4
Actuated g/C Ratio	0.42	0.42		0.33	0.33		0.40	0.40		0.49	0.49	0.49
Clearance Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	321	1202		100	959		138	1056		245	1466	522
v/s Ratio Prot	0.02	c0.34			0.13			c0.30		0.03	c0.34	
v/s Ratio Perm	0.11			0.20			0.23			0.17		0.03
v/c Ratio	0.30	0.81		0.62	0.39		0.59	0.75		0.40	0.68	0.06
Uniform Delay, d1	16.6	23.1		25.3	23.1		21.4	23.3		14.0	17.4	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.44	1.25	2.16
Incremental Delay, d2	0.5	6.0		25.6	1.2		17.4	5.0		0.8	2.0	0.2
Delay (s)	17.1	29.1		50.9	24.3		38.8	28.2		20.9	23.8	26.0
Level of Service	B	C		D	C		D	C		C	C	C
Approach Delay (s)		28.0			28.0			29.2			23.6	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1073: Ashland Ave. □ W Fulton St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	40	29	0	700	941	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11
Total Lost time (s)	3.0			3.0	3.0	
Lane Util. Factor	1.00			0.95	0.95	
Frbp, ped/bikes	0.97			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.94			1.00	1.00	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1253			2908	2975	
Flt Permitted	0.97			1.00	1.00	
Satd. Flow (perm)	1253			2908	2975	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	44	32	0	769	1034	26
RTOR Reduction (vph)	25	0	0	0	2	0
Lane Group Flow (vph)	51	0	0	769	1058	0
Confl. Peds. (#/hr)	23	12				
Heavy Vehicles (%)	30%	14%	0%	8%	5%	12%
Parking (#/hr)				0	0	
Turn Type	NA		custom	NA	NA	
Protected Phases	4		5 10	2 10	6	
Permitted Phases			2			
Actuated Green, G (s)	19.0			57.0	49.0	
Effective Green, g (s)	19.0			57.0	49.0	
Actuated g/C Ratio	0.21			0.63	0.54	
Clearance Time (s)	3.0				3.0	
Lane Grp Cap (vph)	264			1841	1619	
v/s Ratio Prot	c0.04			c0.26	c0.36	
v/s Ratio Perm						
v/c Ratio	0.19			0.42	0.65	
Uniform Delay, d1	29.2			8.2	14.5	
Progression Factor	1.00			0.03	1.00	
Incremental Delay, d2	1.6			0.6	2.1	
Delay (s)	30.8			0.9	16.6	
Level of Service	C			A	B	
Approach Delay (s)	30.8			0.9	16.6	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1074: Ashland Ave. □ W Fulton St. (East)

8/8/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕↔		↔	↕↕
Volume (vph)	6	15	700	15	29	941
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10
Total Lost time (s)	3.0		3.0		2.0	3.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	0.91		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.91		1.00		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1097		2797		1596	2827
Flt Permitted	0.99		1.00		0.29	1.00
Satd. Flow (perm)	1097		2797		484	2827
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	7	16	769	16	32	1034
RTOR Reduction (vph)	13	0	2	0	0	0
Lane Group Flow (vph)	10	0	783	0	32	1034
Confl. Peds. (#/hr)	12	23				
Heavy Vehicles (%)	33%	20%	8%	13%	0%	5%
Parking (#/hr)			0			8
Turn Type	NA		NA		custom	NA
Protected Phases	8		2		1 14	6 14
Permitted Phases					6	
Actuated Green, G (s)	19.0		49.0		60.0	57.0
Effective Green, g (s)	19.0		49.0		60.0	57.0
Actuated g/C Ratio	0.21		0.54		0.67	0.63
Clearance Time (s)	3.0		3.0			
Lane Grp Cap (vph)	231		1522		458	1790
v/s Ratio Prot	c0.01		0.28		c0.01	c0.37
v/s Ratio Perm					0.04	
v/c Ratio	0.04		0.51		0.07	0.58
Uniform Delay, d1	28.3		13.0		5.6	9.5
Progression Factor	1.00		0.11		0.10	0.05
Incremental Delay, d2	0.4		1.1		0.2	1.0
Delay (s)	28.6		2.6		0.8	1.5
Level of Service	C		A		A	A
Approach Delay (s)	28.6		2.6			1.5
Approach LOS	C		A			A

Intersection Summary

HCM 2000 Control Delay	2.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1077: Ashland Ave. □ W Lake St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Volume (vph)	35	221	37	6	124	42	13	666	29	62	899	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	10	10	12
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.86	1.00	1.00	0.72
Flpb, ped/bikes		1.00			1.00		0.96	1.00	1.00	0.97	1.00	1.00
Frt		0.98			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1623			1590		1529	2518	781	1542	3099	986
Flt Permitted		0.95			0.99		0.24	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)		1545			1571		385	2518	781	549	3099	986
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	38	243	41	7	136	46	14	732	32	68	988	30
RTOR Reduction (vph)	0	6	0	0	13	0	0	0	12	0	0	11
Lane Group Flow (vph)	0	316	0	0	176	0	14	732	20	68	988	19
Confl. Peds. (#/hr)	10		36	36		10	77		34	34		77
Confl. Bikes (#/hr)			3						2			6
Heavy Vehicles (%)	9%	8%	3%	50%	7%	7%	0%	9%	10%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								36	36			0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		26.0			26.0		56.0	56.0	56.0	56.0	56.0	56.0
Effective Green, g (s)		26.0			26.0		56.0	56.0	56.0	56.0	56.0	56.0
Actuated g/C Ratio		0.29			0.29		0.62	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		446			453		239	1566	485	341	1928	613
v/s Ratio Prot								0.29			c0.32	
v/s Ratio Perm		c0.20			0.11		0.04		0.03	0.12		0.02
v/c Ratio		0.71			0.39		0.06	0.47	0.04	0.20	0.51	0.03
Uniform Delay, d1		28.6			25.6		6.7	9.1	6.6	7.3	9.4	6.5
Progression Factor		1.00			1.00		1.22	1.36	1.78	0.33	0.28	0.08
Incremental Delay, d2		9.2			2.5		0.4	1.0	0.2	1.1	0.8	0.1
Delay (s)		37.8			28.1		8.6	13.3	11.9	3.6	3.5	0.6
Level of Service		D			C		A	B	B	A	A	A
Approach Delay (s)		37.8			28.1			13.1			3.4	
Approach LOS		D			C			B			A	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1079: Ashland Ave. □ W Washington Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↑↑	↗	↙	↑↑↑			↑↑↑		
Volume (vph)	0	0	0	7	98	10	106	880	0	0	1029	83	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	10	10	10	11	11	11	11	11	11	
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Util. Factor				1.00	0.95	1.00	1.00	0.91			0.91		
Frbp, ped/bikes				1.00	1.00	0.96	1.00	1.00			0.99		
Flpb, ped/bikes				1.00	1.00	1.00	0.99	1.00			1.00		
Frt				1.00	1.00	0.85	1.00	1.00			0.99		
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1589	3160	1246	1599	4291			4134		
Flt Permitted				0.95	1.00	1.00	0.19	1.00			1.00		
Satd. Flow (perm)				1589	3160	1246	319	4291			4134		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	8	108	11	116	967	0	0	1131	91	
RTOR Reduction (vph)	0	0	0	0	0	8	0	0	0	0	10	0	
Lane Group Flow (vph)	0	0	0	8	108	3	116	967	0	0	1212	0	
Confl. Peds. (#/hr)	23		4	4		23	56		27	27		56	
Confl. Bikes (#/hr)			1			2						3	
Heavy Vehicles (%)	0%	0%	0%	0%	1%	10%	2%	7%	0%	0%	4%	5%	
Parking (#/hr)								0				26	
Turn Type				Perm	NA	Perm	Perm	NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8		8	2						
Actuated Green, G (s)				26.0	26.0	26.0	56.0	56.0			56.0		
Effective Green, g (s)				26.0	26.0	26.0	56.0	56.0			56.0		
Actuated g/C Ratio				0.29	0.29	0.29	0.62	0.62			0.62		
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Grp Cap (vph)				459	912	359	198	2669			2572		
v/s Ratio Prot					c0.03			0.23			0.29		
v/s Ratio Perm				0.01		0.00	c0.36						
v/c Ratio				0.02	0.12	0.01	0.59	0.36			0.47		
Uniform Delay, d1				22.9	23.6	22.8	10.1	8.3			9.1		
Progression Factor				1.00	1.00	1.00	1.25	0.46			1.18		
Incremental Delay, d2				0.1	0.3	0.0	11.4	0.4			0.6		
Delay (s)				22.9	23.8	22.9	24.0	4.2			11.3		
Level of Service				C	C	C	C	A			B		
Approach Delay (s)		0.0			23.7			6.3			11.3		
Approach LOS		A			C			A			B		
Intersection Summary													
HCM 2000 Control Delay			9.7		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.44										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			58.6%		ICU Level of Service						B		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
1080: Ashland Ave. □ W Warren Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕						↕↕↕		↕	↕↕↕		
Volume (vph)	108	267	41	0	0	0	0	825	4	42	887	0	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11	
Total Lost time (s)		4.0						4.0		4.0	4.0		
Lane Util. Factor		0.95						0.91		1.00	0.91		
Frbp, ped/bikes		1.00						1.00		1.00	1.00		
Flpb, ped/bikes		1.00						1.00		0.99	1.00		
Frt		0.99						1.00		1.00	1.00		
Flt Protected		0.99						1.00		0.95	1.00		
Satd. Flow (prot)		2871						3892		1400	3850		
Flt Permitted		0.99						1.00		0.28	1.00		
Satd. Flow (perm)		2871						3892		414	3850		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	119	293	45	0	0	0	0	907	4	46	975	0	
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	448	0	0	0	0	0	911	0	46	975	0	
Confl. Peds. (#/hr)	3		5	5		3	32		29	29		32	
Confl. Bikes (#/hr)			4						2			2	
Heavy Vehicles (%)	7%	3%	2%	0%	0%	0%	0%	6%	25%	5%	4%	0%	
Parking (#/hr)								0			18		
Turn Type	Perm	NA						NA		Perm	NA		
Protected Phases		4						2			6		
Permitted Phases	4									6			
Actuated Green, G (s)		26.0						56.0		56.0	56.0		
Effective Green, g (s)		26.0						56.0		56.0	56.0		
Actuated g/C Ratio		0.29						0.62		0.62	0.62		
Clearance Time (s)		4.0						4.0		4.0	4.0		
Lane Grp Cap (vph)		829						2421		257	2395		
v/s Ratio Prot								0.23			c0.25		
v/s Ratio Perm		0.16								0.11			
v/c Ratio		0.54						0.38		0.18	0.41		
Uniform Delay, d1		27.0						8.4		7.2	8.6		
Progression Factor		1.00						0.31		0.11	0.09		
Incremental Delay, d2		2.5						0.4		1.4	0.5		
Delay (s)		29.5						3.0		2.1	1.2		
Level of Service		C						A		A	A		
Approach Delay (s)		29.5			0.0			3.0			1.3		
Approach LOS		C			A			A			A		
Intersection Summary													
HCM 2000 Control Delay			7.3									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.45										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			58.6%									ICU Level of Service	B
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1082: Ashland Ave. □ W Madison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑		↗	↑↑		↗	↑↑↑		↗	↑↑↑	
Volume (vph)	47	278	39	20	187	73	30	759	5	58	952	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		2.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1485	2833		1580	2771		1404	4249		1563	4425	
Flt Permitted	0.58	1.00		0.34	1.00		0.16	1.00		0.25	1.00	
Satd. Flow (perm)	902	2833		563	2771		237	4249		408	4425	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	52	305	43	22	205	80	33	834	5	64	1046	33
RTOR Reduction (vph)	0	12	0	0	21	0	0	1	0	0	4	0
Lane Group Flow (vph)	52	336	0	22	265	0	33	838	0	64	1075	0
Confl. Peds. (#/hr)	16		23	23		16	25		17	17		25
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	6%	10%	10%	0%	11%	5%	17%	8%	0%	5%	3%	7%
Parking (#/hr)								0				0
Turn Type	Perm	NA		custom	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			3			2			6		
Actuated Green, G (s)	33.0	33.0		49.0	49.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	33.0	33.0		49.0	49.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.37	0.37		0.54	0.54		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	330	1038		306	1508		86	1557		149	1622	
v/s Ratio Prot		c0.12			c0.10			0.20			c0.24	
v/s Ratio Perm	0.06			0.04			0.14			0.16		
v/c Ratio	0.16	0.32		0.07	0.18		0.38	0.54		0.43	0.66	
Uniform Delay, d1	19.2	20.5		9.7	10.3		21.0	22.5		21.4	23.8	
Progression Factor	1.00	1.00		1.00	1.00		0.74	0.76		0.36	0.38	
Incremental Delay, d2	1.0	0.8		0.5	0.3		10.7	1.1		8.3	2.0	
Delay (s)	20.2	21.3		10.2	10.6		26.3	18.2		16.0	11.2	
Level of Service	C	C		B	B		C	B		B	B	
Approach Delay (s)		21.2			10.5			18.5			11.5	
Approach LOS		C			B			B			B	

Intersection Summary

HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1083: Ashland Ave. □ W Ogden Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑			↑↑	↘		↑↑↑	
Volume (vph)	160	558	0	250	569	1	0	633	331	0	783	228
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		3.0	4.0			4.0	3.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95	1.00		0.91	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1628	3288		1589	3143			3033	1192		4214	
Flt Permitted	0.41	1.00		0.24	1.00			1.00	1.00		1.00	
Satd. Flow (perm)	710	3288		403	3143			3033	1192		4214	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	176	613	0	275	625	1	0	696	364	0	860	251
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	29	0	58	0
Lane Group Flow (vph)	176	613	0	275	626	0	0	696	335	0	1053	0
Confl. Peds. (#/hr)	1		5	5		1	20		15	15		20
Confl. Bikes (#/hr)			3									2
Heavy Vehicles (%)	5%	4%	0%	4%	5%	100%	0%	9%	9%	0%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	8	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA		pm+pt	NA			NA	pm+ov		NA	
Protected Phases		4		3	8			2	3		6	
Permitted Phases	4			8					2			
Actuated Green, G (s)	27.0	27.0		38.0	38.0			44.0	52.0		44.0	
Effective Green, g (s)	27.0	27.0		38.0	38.0			44.0	52.0		44.0	
Actuated g/C Ratio	0.30	0.30		0.42	0.42			0.49	0.58		0.49	
Clearance Time (s)	4.0	4.0		3.0	4.0			4.0	3.0		4.0	
Lane Grp Cap (vph)	213	986		275	1327			1482	688		2060	
v/s Ratio Prot		0.19		c0.09	0.20			0.23	0.04		c0.25	
v/s Ratio Perm	0.25			c0.33					0.24			
v/c Ratio	0.83	0.62		1.00	0.47			0.47	0.49		0.51	
Uniform Delay, d1	29.3	27.1		23.3	18.8			15.3	11.2		15.7	
Progression Factor	1.00	1.00		1.00	1.00			1.48	0.98		0.45	
Incremental Delay, d2	29.3	2.9		54.3	1.2			0.9	2.1		0.7	
Delay (s)	58.6	30.1		77.6	20.0			23.5	13.1		7.8	
Level of Service	E	C		E	B			C	B		A	
Approach Delay (s)		36.4			37.6			19.9			7.8	
Approach LOS		D			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1084: Ashland Ave. □ W Monroe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↕
Volume (vph)	1	72	30	46	20	21	16	906	68	73	896	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91	0.91	1.00	0.95	
Frbp, ped/bikes		0.99			1.00		1.00	1.00	0.91	1.00	1.00	
Flpb, ped/bikes		1.00			0.99		0.99	1.00	1.00	0.99	1.00	
Frt		0.96			0.97		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.97		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1563			1473		1579	2516	894	1558	2915	
Flt Permitted		1.00			0.83		0.26	1.00	1.00	0.24	1.00	
Satd. Flow (perm)		1562			1257		433	2516	894	396	2915	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1	79	33	51	22	23	18	996	75	80	985	2
RTOR Reduction (vph)	0	17	0	0	13	0	0	1	19	0	0	0
Lane Group Flow (vph)	0	96	0	0	83	0	18	1003	48	80	987	0
Confl. Peds. (#/hr)	5		15	15			5	16		39	39	16
Confl. Bikes (#/hr)			2				1			1		
Heavy Vehicles (%)	0%	3%	0%	7%	5%	5%	0%	8%	3%	1%	4%	0%
Parking (#/hr)								24	24		0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)		18.0			18.0		64.0	64.0	64.0	64.0	64.0	
Effective Green, g (s)		18.0			18.0		64.0	64.0	64.0	64.0	64.0	
Actuated g/C Ratio		0.20			0.20		0.71	0.71	0.71	0.71	0.71	
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		312			251		307	1789	635	281	2072	
v/s Ratio Prot								c0.40				0.34
v/s Ratio Perm		0.06			c0.07		0.04		0.05	0.20		
v/c Ratio		0.31			0.33		0.06	0.56	0.08	0.28	0.48	
Uniform Delay, d1		30.7			30.8		3.9	6.2	4.0	4.7	5.7	
Progression Factor		1.00			1.00		0.77	0.48	0.96	0.33	0.30	
Incremental Delay, d2		2.6			3.5		0.3	1.0	0.2	2.0	0.6	
Delay (s)		33.2			34.4		3.3	4.0	4.0	3.5	2.3	
Level of Service		C			C		A	A	A	A	A	
Approach Delay (s)		33.2			34.4			4.0			2.4	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1085: Ashland Ave. □ W Adams St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔		↖	↗↗			↗↗	↖
Volume (vph)	0	0	0	202	141	145	75	883	0	0	889	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)					4.0		4.0	4.0			4.0	4.0
Lane Util. Factor					0.95		1.00	0.95			0.95	1.00
Frbp, ped/bikes					0.98		1.00	1.00			1.00	0.90
Flpb, ped/bikes					0.97		0.99	1.00			1.00	1.00
Frt					0.96		1.00	1.00			1.00	0.85
Flt Protected					0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)					2730		1629	2495			2897	1077
Flt Permitted					0.98		0.24	1.00			1.00	1.00
Satd. Flow (perm)					2730		411	2495			2897	1077
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	222	155	159	82	970	0	0	977	73
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	0	0	0	28
Lane Group Flow (vph)	0	0	0	0	484	0	82	970	0	0	977	45
Confl. Peds. (#/hr)	32		53	53		32	45		25	25		45
Confl. Bikes (#/hr)			1			1			2			3
Heavy Vehicles (%)	0%	0%	0%	5%	6%	3%	0%	8%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								54			12	12
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					27.0		55.0	55.0			55.0	55.0
Effective Green, g (s)					27.0		55.0	55.0			55.0	55.0
Actuated g/C Ratio					0.30		0.61	0.61			0.61	0.61
Clearance Time (s)					4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)					819		251	1524			1770	658
v/s Ratio Prot								c0.39			0.34	
v/s Ratio Perm					0.18		0.20					0.04
v/c Ratio					0.59		0.33	0.64			0.55	0.07
Uniform Delay, d1					26.8		8.5	11.1			10.3	7.1
Progression Factor					1.00		2.07	2.11			0.50	0.66
Incremental Delay, d2					3.1		3.2	1.9			1.1	0.2
Delay (s)					29.9		20.9	25.4			6.2	4.9
Level of Service					C		C	C			A	A
Approach Delay (s)		0.0			29.9			25.1			6.1	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1086: Ashland Ave. □ W Jackson Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕	↗	↘	↕↕	
Volume (vph)	34	166	85	0	0	0	0	760	67	91	801	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0					4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95	1.00					0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3233	1458					3033	1187	1616	2755	
Flt Permitted		0.99	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)		3233	1458					3033	1187	488	2755	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	37	182	93	0	0	0	0	835	74	100	880	0
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	219	29	0	0	0	0	835	44	100	880	0
Confl. Peds. (#/hr)	12		16	16		12			9	9		17
Heavy Vehicles (%)	3%	5%	2%	0%	0%	0%	2%	9%	6%	2%	8%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)									0		20	
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		28.0	28.0					53.0	53.0	53.0	53.0	
Effective Green, g (s)		28.0	28.0					53.0	53.0	53.0	53.0	
Actuated g/C Ratio		0.31	0.31					0.59	0.59	0.59	0.59	
Clearance Time (s)		5.0	5.0					4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		1005	453					1786	699	287	1622	
v/s Ratio Prot								0.28			c0.32	
v/s Ratio Perm		0.07	0.02						0.04	0.20		
v/c Ratio		0.22	0.06					0.47	0.06	0.35	0.54	
Uniform Delay, d1		22.9	21.8					10.5	7.9	9.6	11.2	
Progression Factor		1.00	1.00					1.00	1.00	1.41	1.44	
Incremental Delay, d2		0.5	0.3					0.9	0.2	2.8	1.1	
Delay (s)		23.4	22.1					11.4	8.1	16.2	17.2	
Level of Service		C	C					B	A	B	B	
Approach Delay (s)		23.0			0.0			11.1			17.1	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1088: Ashland Ave. □ W Van Buren St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↕	↗	↙	↕	↗		↕	↗	
Volume (vph)	0	0	0	748	287	193	276	905	0	0	864	157	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	11	11	11	10	10	10	11	11	11	
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Util. Factor				1.00	0.95	1.00	0.86	0.86			0.91		
Frbp, ped/bikes				1.00	1.00	0.96	1.00	1.00			0.99		
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00		
Frt				1.00	1.00	0.85	1.00	1.00			0.98		
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1632	3149	1353	1271	3831			4228		
Flt Permitted				0.95	1.00	1.00	0.19	0.74			1.00		
Satd. Flow (perm)				1632	3149	1353	252	2863			4228		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	822	315	212	303	995	0	0	949	173	
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	0	0	26	0	
Lane Group Flow (vph)	0	0	0	822	315	117	212	1086	0	0	1096	0	
Confl. Peds. (#/hr)	19		2	2		19	13		9	9		13	
Confl. Bikes (#/hr)						1			2			2	
Heavy Vehicles (%)	0%	0%	0%	1%	5%	5%	8%	9%	0%	0%	5%	7%	
Parking (#/hr)								0				0	
Turn Type				Perm	NA	Perm	pm+pt	NA			NA		
Protected Phases					8		5	2			6		
Permitted Phases				8		8	2						
Actuated Green, G (s)				29.0	29.0	29.0	63.0	63.0			48.0		
Effective Green, g (s)				29.0	29.0	29.0	63.0	63.0			48.0		
Actuated g/C Ratio				0.29	0.29	0.29	0.63	0.63			0.48		
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Grp Cap (vph)				473	913	392	270	1910			2029		
v/s Ratio Prot					0.10		c0.09	0.06			0.26		
v/s Ratio Perm				c0.50		0.09	c0.41	0.30					
v/c Ratio				1.74	0.35	0.30	0.79	0.57			0.54		
Uniform Delay, d1				35.5	28.0	27.6	22.5	10.7			18.3		
Progression Factor				1.00	1.00	1.00	0.59	0.24			1.00		
Incremental Delay, d2				340.8	1.0	1.9	14.5	0.8			1.0		
Delay (s)				376.3	29.0	29.5	27.8	3.4			19.3		
Level of Service				F	C	C	C	A			B		
Approach Delay (s)		0.0			240.7			7.4			19.3		
Approach LOS		A			F			A			B		
Intersection Summary													
HCM 2000 Control Delay			94.4		HCM 2000 Level of Service						F		
HCM 2000 Volume to Capacity ratio			1.11										
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						12.0		
Intersection Capacity Utilization			73.5%		ICU Level of Service						D		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1089: Ashland Ave. □ W Congress Pkwy

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕↕		↘	↕↕↕	
Volume (vph)	150	171	221	0	0	0	0	1031	344	188	1424	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	10	10	10
Total Lost time (s)		6.0	6.0					4.0		6.0	6.0	
Lane Util. Factor		0.95	1.00					0.91		1.00	0.91	
Frbp, ped/bikes		1.00	0.98					1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		3155	1471					4058		1520	4258	
Flt Permitted		0.98	1.00					1.00		0.10	1.00	
Satd. Flow (perm)		3155	1471					4058		162	4258	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	165	188	243	0	0	0	0	1133	378	207	1565	0
RTOR Reduction (vph)	0	0	57	0	0	0	0	60	0	0	0	0
Lane Group Flow (vph)	0	353	186	0	0	0	0	1451	0	207	1565	0
Confl. Peds. (#/hr)			6	6			2		3	3		2
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	7%	5%	2%	0%	0%	0%	0%	9%	2%	5%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		25.0	25.0					48.0		63.0	63.0	
Effective Green, g (s)		25.0	25.0					48.0		63.0	63.0	
Actuated g/C Ratio		0.25	0.25					0.48		0.63	0.63	
Clearance Time (s)		6.0	6.0					4.0		6.0	6.0	
Lane Grp Cap (vph)		788	367					1947		251	2682	
v/s Ratio Prot								0.36		c0.09	0.37	
v/s Ratio Perm		0.11	c0.13							c0.43		
v/c Ratio		0.45	0.51					0.75		0.82	0.58	
Uniform Delay, d1		31.7	32.2					21.0		27.0	10.8	
Progression Factor		1.00	1.00					0.37		1.11	0.97	
Incremental Delay, d2		1.8	4.9					2.2		2.9	0.1	
Delay (s)		33.5	37.1					9.9		32.9	10.5	
Level of Service		C	D					A		C	B	
Approach Delay (s)		35.0			0.0			9.9			13.1	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1090: Ashland Ave. □ W Harrison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↔		↖	↔		↖	↔		↖	↔	
Volume (vph)	174	123	43	100	202	48	43	1219	56	26	1435	374
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	0.91	0.91		1.00	0.95		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.98		1.00	0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		0.95	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1492	2943		1496	2899		1652	4133		1582	4227	
Flt Permitted	0.44	0.76		0.59	1.00		0.07	1.00		0.14	1.00	
Satd. Flow (perm)	690	2281		924	2899		126	4133		229	4227	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	191	135	47	110	222	53	47	1340	62	29	1577	411
RTOR Reduction (vph)	0	13	0	0	21	0	0	5	0	0	47	0
Lane Group Flow (vph)	117	243	0	110	255	0	47	1397	0	29	1941	0
Confl. Peds. (#/hr)	31		71	71		31	22		41	41		22
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	0%	2%	0%	1%	7%	0%	0%	9%	7%	4%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.0	35.0		18.0	18.0		55.0	55.0		55.0	55.0	
Effective Green, g (s)	35.0	35.0		18.0	18.0		55.0	55.0		55.0	55.0	
Actuated g/C Ratio	0.35	0.35		0.18	0.18		0.55	0.55		0.55	0.55	
Clearance Time (s)	3.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	353	891		166	521		69	2273		125	2324	
v/s Ratio Prot	c0.05	0.04			0.09			0.34			c0.46	
v/s Ratio Perm	0.07	0.06		c0.12			0.37			0.13		
v/c Ratio	0.33	0.27		0.66	0.49		0.68	0.61		0.23	0.84	
Uniform Delay, d1	23.1	23.4		38.2	36.9		16.2	15.3		11.6	18.7	
Progression Factor	1.00	1.00		1.00	1.00		0.32	0.23		0.37	0.34	
Incremental Delay, d2	2.5	0.8		18.9	3.3		39.2	1.1		3.7	3.3	
Delay (s)	25.6	24.1		57.1	40.1		44.4	4.6		8.1	9.5	
Level of Service	C	C		E	D		D	A		A	A	
Approach Delay (s)		24.6			45.0			5.9			9.5	
Approach LOS		C			D			A			A	

Intersection Summary

HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1091: Ashland Ave. □ W Flourney St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	109	0	14	2	1	9	112	1258	5	1	1029	453
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0		5.0		5.0		4.0	4.0			4.0	
Lane Util. Factor	0.97		1.00		1.00		1.00	0.91			0.91	
Frpb, ped/bikes	1.00		0.99		0.98		1.00	1.00			0.98	
Flpb, ped/bikes	0.99		1.00		1.00		1.00	1.00			1.00	
Frt	1.00		0.85		0.90		1.00	1.00			0.95	
Flt Protected	0.95		1.00		0.99		0.95	1.00			1.00	
Satd. Flow (prot)	3065		1409		1573		1649	4249			4213	
Flt Permitted	0.75		1.00		0.99		0.11	1.00			0.94	
Satd. Flow (perm)	2416		1409		1573		195	4249			3958	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	0	15	2	1	10	123	1382	5	1	1131	498
RTOR Reduction (vph)	0	0	11	0	7	0	0	0	0	0	79	0
Lane Group Flow (vph)	120	0	4	0	6	0	123	1387	0	0	1551	0
Confl. Peds. (#/hr)	9		1	1		9	14		21	21		14
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	3%	0%
Parking (#/hr)								0				0
Turn Type	custom		custom	Perm	NA		Perm	NA		Perm	NA	
Protected Phases					8			2				6
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	26.0		26.0		26.0		65.0	65.0			65.0	
Effective Green, g (s)	26.0		26.0		26.0		65.0	65.0			65.0	
Actuated g/C Ratio	0.26		0.26		0.26		0.65	0.65			0.65	
Clearance Time (s)	5.0		5.0		5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	628		366		408		126	2761			2572	
v/s Ratio Prot								0.33				
v/s Ratio Perm	c0.05		0.00		0.00		c0.63				0.39	
v/c Ratio	0.19		0.01		0.01		0.98	0.50			0.60	
Uniform Delay, d1	28.8		27.5		27.5		16.8	9.1			10.1	
Progression Factor	1.00		1.00		1.00		0.59	0.23			0.23	
Incremental Delay, d2	0.7		0.1		0.1		68.6	0.6			0.6	
Delay (s)	29.5		27.5		27.5		78.6	2.6			2.9	
Level of Service	C		C		C		E	A			A	
Approach Delay (s)		29.3			27.5			8.8			2.9	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1092: Ashland Ave. □ W Polk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑↑		↕	↑↑↑	
Volume (vph)	86	16	37	6	28	57	83	1287	15	30	886	223
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes		0.95			0.94		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		0.96			0.99		0.99	1.00		0.99	1.00	
Frt		0.96			0.92		1.00	1.00		1.00	0.97	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1418			1425		1641	4185		1632	4111	
Flt Permitted		0.79			0.98		0.19	1.00		0.15	1.00	
Satd. Flow (perm)		1151			1406		330	4185		250	4111	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	95	18	41	7	31	63	91	1414	16	33	974	245
RTOR Reduction (vph)	0	13	0	0	35	0	0	1	0	0	44	0
Lane Group Flow (vph)	0	141	0	0	66	0	91	1429	0	33	1175	0
Confl. Peds. (#/hr)	60		129	129		60	14		39	39		14
Confl. Bikes (#/hr)			4			6			5			
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	8%	20%	0%	6%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio		0.28			0.28		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		322			393		211	2678		160	2631	
v/s Ratio Prot								c0.34			0.29	
v/s Ratio Perm		c0.12			0.05		0.28			0.13		
v/c Ratio		0.44			0.17		0.43	0.53		0.21	0.45	
Uniform Delay, d1		29.5			27.2		9.0	9.8		7.5	9.1	
Progression Factor		1.00			1.00		1.01	0.91		1.05	0.94	
Incremental Delay, d2		4.3			0.9		6.1	0.7		2.4	0.5	
Delay (s)		33.8			28.1		15.1	9.7		10.2	9.0	
Level of Service		C			C		B	A		B	A	
Approach Delay (s)		33.8			28.1			10.1			9.0	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1093: Ashland Ave. □ W Taylor St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	36	90	37	44	169	55	91	997	51	69	561	167
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.90	1.00	1.00	0.98	1.00	1.00	0.98	1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1441	1556	1369	1526	1570	1187	1620	4064		1566	4039	
Flt Permitted	0.54	1.00	1.00	0.69	1.00	1.00	0.33	1.00		0.21	1.00	
Satd. Flow (perm)	822	1556	1369	1105	1570	1187	555	4064		347	4039	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	40	99	41	48	186	60	100	1096	56	76	616	184
RTOR Reduction (vph)	0	0	30	0	0	43	0	6	0	0	54	0
Lane Group Flow (vph)	40	99	11	48	186	17	100	1146	0	76	746	0
Confl. Peds. (#/hr)	98		20	20		98	15		23	23		15
Confl. Bikes (#/hr)			2			5			1			3
Heavy Vehicles (%)	0%	8%	0%	2%	7%	2%	0%	10%	16%	4%	8%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	28.0	28.0	28.0	28.0	28.0	28.0	63.0	63.0		63.0	63.0	
Effective Green, g (s)	28.0	28.0	28.0	28.0	28.0	28.0	63.0	63.0		63.0	63.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.63	0.63		0.63	0.63	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	230	435	383	309	439	332	349	2560		218	2544	
v/s Ratio Prot		0.06			c0.12			c0.28			0.18	
v/s Ratio Perm	0.05		0.01	0.04		0.01	0.18			0.22		
v/c Ratio	0.17	0.23	0.03	0.16	0.42	0.05	0.29	0.45		0.35	0.29	
Uniform Delay, d1	27.2	27.7	26.1	27.1	29.4	26.3	8.4	9.5		8.8	8.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.60	0.55		1.56	1.44	
Incremental Delay, d2	1.6	1.2	0.1	1.1	3.0	0.3	0.5	0.1		4.0	0.3	
Delay (s)	28.9	28.9	26.3	28.2	32.4	26.6	5.5	5.4		17.7	12.4	
Level of Service	C	C	C	C	C	C	A	A		B	B	
Approach Delay (s)		28.3			30.5			5.4			12.8	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1094: Ashland Ave. □ W Roosevelt Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	126	663	83	124	899	229	122	1088	93	166	498	89
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95	1.00	1.00	0.93	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3040	1321	1504	3099	1337	2958	2916	1148	3036	3040	1181
Flt Permitted	0.13	1.00	1.00	0.21	1.00	1.00	0.35	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	215	3040	1321	326	3099	1337	1105	2916	1148	364	3040	1181
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	138	729	91	136	988	252	134	1196	102	182	547	98
RTOR Reduction (vph)	0	0	63	0	0	157	0	0	57	0	0	64
Lane Group Flow (vph)	138	729	28	136	988	95	134	1196	45	182	547	34
Confl. Peds. (#/hr)	28		24	24		28	29		52	52		29
Confl. Bikes (#/hr)						4			3			1
Heavy Vehicles (%)	2%	5%	4%	6%	3%	2%	4%	4%	1%	2%	5%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0			0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	41.9	30.7	30.7	42.1	30.8	30.8	41.9	35.0	35.0	42.1	35.1	35.1
Effective Green, g (s)	41.9	30.7	30.7	42.1	30.8	30.8	41.9	35.0	35.0	42.1	35.1	35.1
Actuated g/C Ratio	0.42	0.31	0.31	0.42	0.31	0.31	0.42	0.35	0.35	0.42	0.35	0.35
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	241	933	405	270	954	411	590	1020	401	340	1067	414
v/s Ratio Prot	c0.06	0.24		0.06	c0.32		0.02	c0.41		c0.04	0.18	
v/s Ratio Perm	0.18		0.02	0.15		0.07	0.08		0.04	0.19		0.03
v/c Ratio	0.57	0.78	0.07	0.50	1.04	0.23	0.23	1.17	0.11	0.54	0.51	0.08
Uniform Delay, d1	21.7	31.6	24.5	19.7	34.6	25.8	18.0	32.5	22.0	22.7	25.7	21.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.93	0.77	1.39	0.51	0.12
Incremental Delay, d2	5.2	6.5	0.3	3.1	38.7	1.3	0.2	87.0	0.5	1.6	1.7	0.4
Delay (s)	26.8	38.1	24.9	22.7	73.3	27.1	14.6	117.1	17.5	33.0	14.7	3.0
Level of Service	C	D	C	C	E	C	B	F	B	C	B	A
Approach Delay (s)		35.2			59.9			100.4			17.4	
Approach LOS		D			E			F			B	

Intersection Summary		
HCM 2000 Control Delay	59.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.99	E
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	85.3%	16.0
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

1096: Ashland Ave. □ W 13th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	24	2	24	0	2	1	61	1232	3	3	655	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	11	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		1.00	1.00	
Frt		0.94			0.95		1.00	1.00		1.00	0.99	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1494			1708		1471	2805		1647	2828	
Flt Permitted		0.85			1.00		0.36	1.00		0.18	1.00	
Satd. Flow (perm)		1297			1708		552	2805		320	2828	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	26	2	26	0	2	1	67	1354	3	3	720	51
RTOR Reduction (vph)	0	24	0	0	1	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	30	0	0	2	0	67	1357	0	3	769	0
Confl. Peds. (#/hr)	2		7	7		2	10		8	8		10
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	8%	0%	8%	0%	0%	0%	7%	8%	33%	0%	6%	2%
Parking (#/hr)								0				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.3			8.3		83.7	83.7		83.7	83.7	
Effective Green, g (s)		8.3			8.3		83.7	83.7		83.7	83.7	
Actuated g/C Ratio		0.08			0.08		0.84	0.84		0.84	0.84	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		107			141		462	2347		267	2367	
v/s Ratio Prot					0.00			c0.48			0.27	
v/s Ratio Perm		c0.02					0.12			0.01		
v/c Ratio		0.28			0.01		0.15	0.58		0.01	0.32	
Uniform Delay, d1		43.1			42.1		1.5	2.6		1.3	1.8	
Progression Factor		1.00			1.00		1.00	1.00		1.16	0.97	
Incremental Delay, d2		3.0			0.1		0.7	1.0		0.1	0.3	
Delay (s)		46.1			42.2		2.2	3.6		1.6	2.1	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		46.1			42.2			3.6			2.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1098: Ashland Ave. □ W 14th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	21	0	14	3	1	3	31	1377	0	3	563	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	10	9	11	10	9
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.98		0.99	1.00		1.00	1.00	
Frt		0.95			0.94		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1567			1628		1583	2641		1653	2775	
Flt Permitted		0.88			0.95		0.39	1.00		0.12	1.00	
Satd. Flow (perm)		1419			1579		651	2641		201	2775	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	23	0	15	3	1	3	34	1513	0	3	619	12
RTOR Reduction (vph)	0	11	0	0	2	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	27	0	0	5	0	34	1513	0	3	630	0
Confl. Peds. (#/hr)			30	30			9		6	6		9
Confl. Bikes (#/hr)			2						2			2
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	3%	10%	0%	0%	9%	0%
Parking (#/hr)								16				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.0			26.0		71.0	71.0		71.0	71.0	
Effective Green, g (s)		26.0			26.0		71.0	71.0		71.0	71.0	
Actuated g/C Ratio		0.25			0.25		0.68	0.68		0.68	0.68	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		351			390		440	1785		135	1876	
v/s Ratio Prot								c0.57				0.23
v/s Ratio Perm		c0.02			0.00		0.05			0.01		
v/c Ratio		0.08			0.01		0.08	0.85		0.02	0.34	
Uniform Delay, d1		30.3			29.8		5.8	12.9		5.6	7.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.1		0.3	5.2		0.3	0.5	
Delay (s)		30.7			29.9		6.2	18.1		5.9	7.6	
Level of Service		C			C		A	B		A	A	
Approach Delay (s)		30.7			29.9			17.8			7.6	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1103: Ashland Ave. □ W 18th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	39	154	59	59	246	148	54	1287	53	42	642	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.83	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.91	1.00	1.00	0.97	1.00	1.00	0.96	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1384	1556	1287	1521	1570	1162	1507	2620		1492	2529	
Flt Permitted	0.44	1.00	1.00	0.58	1.00	1.00	0.32	1.00		0.09	1.00	
Satd. Flow (perm)	636	1556	1287	935	1570	1162	513	2620		146	2529	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	43	169	65	65	270	163	59	1414	58	46	705	32
RTOR Reduction (vph)	0	0	45	0	0	35	0	3	0	0	3	0
Lane Group Flow (vph)	43	169	20	65	270	128	59	1469	0	46	734	0
Confl. Peds. (#/hr)	117		28	28		117	39		43	43		39
Confl. Bikes (#/hr)			6			3						1
Heavy Vehicles (%)	5%	8%	5%	2%	7%	2%	2%	8%	15%	7%	12%	14%
Parking (#/hr)								20			20	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	31.0	31.0	31.0	31.0	31.0	31.0	58.0	58.0		58.0	58.0	
Effective Green, g (s)	31.0	31.0	31.0	31.0	31.0	31.0	58.0	58.0		58.0	58.0	
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31	0.58	0.58		0.58	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	197	482	398	289	486	360	297	1519		84	1466	
v/s Ratio Prot		0.11			c0.17			c0.56			0.29	
v/s Ratio Perm	0.07		0.02	0.07		0.11	0.11			0.31		
v/c Ratio	0.22	0.35	0.05	0.22	0.56	0.36	0.20	0.97		0.55	0.50	
Uniform Delay, d1	25.5	26.7	24.2	25.6	28.8	26.7	10.0	20.1		12.9	12.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.58		1.00	1.00	
Incremental Delay, d2	2.5	2.0	0.2	1.8	4.5	2.7	0.8	10.4		23.3	1.2	
Delay (s)	28.1	28.7	24.4	27.4	33.3	29.5	9.6	22.1		36.2	13.7	
Level of Service	C	C	C	C	C	C	A	C		D	B	
Approach Delay (s)		27.6			31.3			21.6			15.0	
Approach LOS		C			C			C			B	

Intersection Summary

HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1105: Ashland Ave. □ W 19th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	53	41	14	38	71	68	49	1354	13	29	695	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	10	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98			0.95		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.97			0.98		0.96	1.00		1.00	1.00	
Frt		0.98			0.95		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1597			1534		1422	2695		1550	2562	
Flt Permitted		0.80			0.92		0.30	1.00		0.10	1.00	
Satd. Flow (perm)		1313			1427		451	2695		165	2562	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	58	45	15	42	78	75	54	1488	14	32	764	49
RTOR Reduction (vph)	0	5	0	0	22	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	113	0	0	173	0	54	1501	0	32	808	0
Confl. Peds. (#/hr)	73		75	75		73	40		59	59		40
Confl. Bikes (#/hr)			1			1			1			2
Heavy Vehicles (%)	4%	2%	0%	0%	1%	6%	8%	8%	0%	3%	9%	2%
Parking (#/hr)								14				24
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		62.0	62.0		62.0	62.0	
Effective Green, g (s)		30.0			30.0		62.0	62.0		62.0	62.0	
Actuated g/C Ratio		0.30			0.30		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		393			428		279	1670		102	1588	
v/s Ratio Prot								c0.56				0.32
v/s Ratio Perm		0.09			c0.12		0.12			0.19		
v/c Ratio		0.29			0.40		0.19	0.90		0.31	0.51	
Uniform Delay, d1		26.8			27.9		8.2	16.3		9.0	10.5	
Progression Factor		1.00			1.00		0.64	0.43		0.59	0.58	
Incremental Delay, d2		1.8			2.8		0.9	4.9		7.3	1.1	
Delay (s)		28.7			30.7		6.1	11.9		12.5	7.2	
Level of Service		C			C		A	B		B	A	
Approach Delay (s)		28.7			30.7			11.7			7.4	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1107: Ashland Ave. □ W 21st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Volume (vph)	44	172	7	93	129	30	3	1285	64	38	670	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	10	10	10
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.99			0.99		1.00	0.99	
Flpb, ped/bikes		0.99			0.98			1.00		1.00	1.00	
Frt		1.00			0.98			0.99		1.00	0.99	
Flt Protected		0.99			0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1722			1612			2651		1550	2597	
Flt Permitted		0.88			0.70			0.95		0.11	1.00	
Satd. Flow (perm)		1528			1150			2530		183	2597	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	48	189	8	102	142	33	3	1412	70	42	736	30
RTOR Reduction (vph)	0	1	0	0	5	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	244	0	0	272	0	0	1482	0	42	764	0
Confl. Peds. (#/hr)	49		88	88		49	43		32	32		43
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	7%	1%	0%	5%	3%	13%	0%	7%	3%	3%	12%	0%
Parking (#/hr)								20			12	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.6			27.6			64.4		64.4	64.4	
Effective Green, g (s)		27.6			27.6			64.4		64.4	64.4	
Actuated g/C Ratio		0.28			0.28			0.64		0.64	0.64	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		5.0			5.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		421			317			1629		117	1672	
v/s Ratio Prot											0.29	
v/s Ratio Perm		0.16			0.24			0.59		0.23		
v/c Ratio		0.58			0.86			0.91		0.36	0.46	
Uniform Delay, d1		31.2			34.3			15.3		8.2	9.0	
Progression Factor		1.00			1.00			1.00		0.59	0.65	
Incremental Delay, d2		3.1			21.5			9.1		7.6	0.8	
Delay (s)		34.2			55.9			24.4		12.5	6.6	
Level of Service		C			E			C		B	A	
Approach Delay (s)		34.2			55.9			24.4			6.9	
Approach LOS		C			E			C			A	

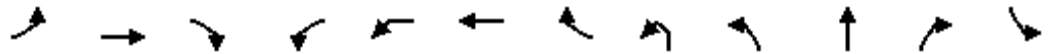
Intersection Summary

HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations	↶	↷			↷	↷			↷	↷	↷	↷
Volume (vph)	74	278	51	91	93	298	104	29	101	1104	153	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	12	11	10	11	12	11	10	11	11	11
Total Lost time (s)	4.0	4.0			3.0	4.0			4.0	4.0	4.0	3.0
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00	0.95	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	0.93			1.00	1.00	0.99	1.00
Flpb, ped/bikes	0.86	1.00			1.00	1.00			0.99	1.00	1.00	1.00
Frt	1.00	0.98			1.00	0.96			1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00			0.95	1.00	1.00	0.95
Satd. Flow (prot)	1222	3080			1341	2716			1442	2386	700	1215
Flt Permitted	0.50	1.00			0.26	1.00			0.28	1.00	1.00	0.08
Satd. Flow (perm)	638	3080			373	2716			432	2386	700	99
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	81	305	56	100	102	327	114	32	111	1213	168	46
RTOR Reduction (vph)	0	0	0	0	0	27	0	0	0	0	50	0
Lane Group Flow (vph)	81	361	0	0	202	414	0	0	143	1213	118	46
Confl. Peds. (#/hr)	155						155		50			
Confl. Bikes (#/hr)							5				1	
Heavy Vehicles (%)	12%	5%	4%	16%	22%	8%	11%	14%	9%	6%	7%	36%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	8	0
Parking (#/hr)									74	74		
Turn Type	Perm	NA		pm+pt	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Perm
Protected Phases		4		3	3	8		5	5	2		
Permitted Phases	4			8	8			2	2		2	6
Actuated Green, G (s)	20.5	20.5			36.5	36.5			59.5	59.5	59.5	51.5
Effective Green, g (s)	20.5	20.5			36.5	36.5			59.5	59.5	59.5	51.5
Actuated g/C Ratio	0.16	0.16			0.28	0.28			0.46	0.46	0.46	0.40
Clearance Time (s)	4.0	4.0			3.0	4.0			4.0	4.0	4.0	3.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	100	485			201	762			236	1092	320	39
v/s Ratio Prot		0.12			c0.10	0.15			0.02	c0.51		
v/s Ratio Perm	0.13				c0.18				0.25		0.17	c0.46
v/c Ratio	0.81	0.74			1.00	0.54			0.61	1.11	0.37	1.18
Uniform Delay, d1	52.9	52.2			43.0	39.7			37.4	35.2	23.0	39.2
Progression Factor	1.00	1.00			1.00	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	37.2	6.1			64.8	0.8			4.3	63.0	3.3	202.0
Delay (s)	90.1	58.4			107.8	40.5			41.8	98.2	26.3	241.3
Level of Service	F	E			F	D			D	F	C	F
Approach Delay (s)		64.2				61.6				85.0		
Approach LOS		E				E				F		

Intersection Summary		
HCM 2000 Control Delay	68.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.12	E
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	87.6%	18.0
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	SBT	SBR	SBR2	NEL	NER	NER2
Lane Configurations	↑↑	↔		↔	↔	
Volume (vph)	601	135	32	196	192	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	12	11	12	12
Total Lost time (s)	3.0	3.0		4.0	4.0	
Lane Util. Factor	0.95	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.84		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.85	
Flt Protected	1.00	1.00		0.95	1.00	
Satd. Flow (prot)	2862	876		1401	1327	
Flt Permitted	1.00	1.00		0.95	1.00	
Satd. Flow (perm)	2862	876		1401	1327	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	660	148	35	215	211	38
RTOR Reduction (vph)	0	61	0	0	76	0
Lane Group Flow (vph)	660	122	0	215	173	0
Confl. Peds. (#/hr)		50				
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	8%	22%	12%	18%	15%	17%
Bus Blockages (#/hr)	0	8	0	0	0	0
Parking (#/hr)	6	6				
Turn Type	NA	Perm		NA	Perm	
Protected Phases	6			9		
Permitted Phases		6			9	
Actuated Green, G (s)	51.5	51.5		22.0	22.0	
Effective Green, g (s)	51.5	51.5		22.0	22.0	
Actuated g/C Ratio	0.40	0.40		0.17	0.17	
Clearance Time (s)	3.0	3.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1133	347		237	224	
v/s Ratio Prot	0.23			0.15		
v/s Ratio Perm		0.14			0.13	
v/c Ratio	0.58	0.35		0.91	0.77	
Uniform Delay, d1	30.8	27.5		53.0	51.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.6		34.3	15.0	
Delay (s)	31.6	28.2		87.3	66.6	
Level of Service	C	C		F	E	
Approach Delay (s)	41.7			76.2		
Approach LOS	D			E		

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1110: Ashland Ave. □ 2451 S Ashland Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	2	0	3	2	0	0	6	1464	0	4	695	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.97			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			0.97		1.00	1.00		1.00	1.00	
Frt		0.92			1.00		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1570			828		1413	3033		1322	3178	
Flt Permitted		1.00			1.00		0.36	1.00		0.15	1.00	
Satd. Flow (perm)		1601			872		537	3033		202	3178	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	2	0	3	2	0	0	7	1609	0	4	764	2
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2	0	7	1609	0	4	766	0
Confl. Peds. (#/hr)	1		2	2		1	1		2	2		1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	100%	0%	0%	17%	9%	0%	25%	4%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		1.9			1.9		88.1	88.1		88.1	88.1	
Effective Green, g (s)		1.9			1.9		88.1	88.1		88.1	88.1	
Actuated g/C Ratio		0.02			0.02		0.88	0.88		0.88	0.88	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		30			16		473	2672		177	2799	
v/s Ratio Prot								c0.53				0.24
v/s Ratio Perm		0.00			c0.00		0.01			0.02		
v/c Ratio		0.00			0.12		0.01	0.60		0.02	0.27	
Uniform Delay, d1		48.1			48.2		0.7	1.5		0.7	0.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			7.3		0.1	1.0		0.2	0.2	
Delay (s)		48.2			55.5		0.8	2.5		1.0	1.2	
Level of Service		D			E		A	A		A	A	
Approach Delay (s)		48.2			55.5			2.5			1.2	
Approach LOS		D			E			A			A	

Intersection Summary

HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1111: Ashland Ave. □ W 27th St.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	1	2	1502	797	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	3.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1710	765	1140	3226	3109	
Flt Permitted	0.95	1.00	0.31	1.00	1.00	
Satd. Flow (perm)	1710	765	374	3226	3109	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1	1	2	1651	876	0
RTOR Reduction (vph)	0	1	0	0	0	0
Lane Group Flow (vph)	1	0	2	1651	876	0
Confl. Peds. (#/hr)			2			2
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	100%	50%	6%	10%	0%
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	1.3	1.3	79.7	79.7	75.6	
Effective Green, g (s)	1.3	1.3	79.7	79.7	75.6	
Actuated g/C Ratio	0.01	0.01	0.89	0.89	0.84	
Clearance Time (s)	4.0	4.0	3.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	24	11	340	2856	2611	
v/s Ratio Prot	c0.00		0.00	c0.51	0.28	
v/s Ratio Perm		0.00	0.01			
v/c Ratio	0.04	0.00	0.01	0.58	0.34	
Uniform Delay, d1	43.7	43.7	0.6	1.2	1.6	
Progression Factor	1.00	1.00	1.05	0.67	1.00	
Incremental Delay, d2	0.7	0.0	0.0	0.6	0.3	
Delay (s)	44.5	43.8	0.7	1.5	2.0	
Level of Service	D	D	A	A	A	
Approach Delay (s)	44.1			1.5	2.0	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	1.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1112: Ashland Ave. □ W Marketplace Access Rd.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	31	17	24	1446	709	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)	4.0	4.0	3.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1062	1024	1281	2702	2603	
Flt Permitted	0.95	1.00	0.33	1.00	1.00	
Satd. Flow (perm)	1062	1024	442	2702	2603	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	34	19	26	1589	779	24
RTOR Reduction (vph)	0	18	0	0	1	0
Lane Group Flow (vph)	34	1	26	1589	802	0
Confl. Peds. (#/hr)		1	3			3
Confl. Bikes (#/hr)						3
Heavy Vehicles (%)	61%	47%	29%	4%	7%	41%
Parking (#/hr)				40	38	
Turn Type	NA	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	6.1	6.1	74.9	74.9	69.4	
Effective Green, g (s)	6.1	6.1	74.9	74.9	69.4	
Actuated g/C Ratio	0.07	0.07	0.83	0.83	0.77	
Clearance Time (s)	4.0	4.0	3.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	71	69	391	2248	2007	
v/s Ratio Prot	c0.03		0.00	c0.59	0.31	
v/s Ratio Perm		0.00	0.05			
v/c Ratio	0.48	0.02	0.07	0.71	0.40	
Uniform Delay, d1	40.4	39.2	1.4	3.1	3.4	
Progression Factor	1.00	1.00	1.00	1.00	0.76	
Incremental Delay, d2	5.0	0.1	0.1	1.9	0.6	
Delay (s)	45.4	39.3	1.5	5.0	3.2	
Level of Service	D	D	A	A	A	
Approach Delay (s)	43.2			4.9	3.2	
Approach LOS	D			A	A	

Intersection Summary				
HCM 2000 Control Delay		5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio		0.72		
Actuated Cycle Length (s)		90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization		53.0%	ICU Level of Service	A
Analysis Period (min)		15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1113: Ashland Ave. □ W 31st Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖		↔			↕		↖	↕	↖
Volume (vph)	389	4	187	26	0	16	0	1010	33	11	566	227
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0		4.0			12.0		12.0	12.0	12.0
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00		1.00			1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85		0.95			1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.97			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1525	1531	1222		1179			3097		896	3090	1352
Flt Permitted	0.95	0.95	1.00		0.97			1.00		0.19	1.00	1.00
Satd. Flow (perm)	1525	1531	1222		1179			3097		178	3090	1352
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	427	4	205	29	0	18	0	1110	36	12	622	249
RTOR Reduction (vph)	0	0	155	0	45	0	0	2	0	0	0	116
Lane Group Flow (vph)	213	218	50	0	2	0	0	1144	0	12	622	133
Confl. Peds. (#/hr)							1		47	47		1
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	0%	21%	27%	0%	62%	0%	5%	33%	82%	7%	7%
Turn Type	Split	NA	Perm	Split	NA			NA		Perm	NA	Perm
Protected Phases	4	4		8	8			2			6	
Permitted Phases			4							6		6
Actuated Green, G (s)	27.0	27.0	27.0		4.4			58.6		58.6	58.6	58.6
Effective Green, g (s)	27.0	27.0	27.0		4.4			58.6		58.6	58.6	58.6
Actuated g/C Ratio	0.25	0.25	0.25		0.04			0.53		0.53	0.53	0.53
Clearance Time (s)	4.0	4.0	4.0		4.0			12.0		12.0	12.0	12.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	374	375	299		47			1649		94	1646	720
v/s Ratio Prot	0.14	c0.14			c0.00			c0.37			0.20	
v/s Ratio Perm			0.04							0.07		0.10
v/c Ratio	0.57	0.58	0.17		0.04			0.69		0.13	0.38	0.18
Uniform Delay, d1	36.4	36.5	32.7		50.8			19.1		12.9	15.0	13.3
Progression Factor	1.00	1.00	1.00		1.00			0.43		1.00	1.00	1.00
Incremental Delay, d2	6.2	6.4	1.2		0.4			1.5		2.8	0.7	0.6
Delay (s)	42.6	43.0	33.9		51.1			9.7		15.7	15.7	13.9
Level of Service	D	D	C		D			A		B	B	B
Approach Delay (s)		39.9			51.1			9.7			15.2	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1114: Ashland Ave. □ S Archer Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑			↑↑	↗	↗	↑↑	↗
Volume (vph)	173	1002	24	78	626	77	1	804	218	134	484	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	11	11	11	11	11	11	12
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0	3.0	3.0	5.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91			0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1604	4630		1558	4328			2932	1178	1544	2926	1137
Flt Permitted	0.23	1.00		0.16	1.00			0.95	1.00	0.17	1.00	1.00
Satd. Flow (perm)	385	4630		258	4328			2799	1178	279	2926	1137
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	190	1101	26	86	688	85	1	884	240	147	532	99
RTOR Reduction (vph)	0	2	0	0	14	0	0	0	44	0	0	20
Lane Group Flow (vph)	190	1125	0	86	759	0	0	885	196	147	532	79
Confl. Peds. (#/hr)	5		32	32		5	19		27	27		19
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	3%	2%	8%	6%	4%	4%	100%	7%	6%	7%	13%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0			18
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4		3	8			2	3	1	6	7
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	47.0	38.0		39.0	33.0			43.0	49.0	53.0	53.0	64.0
Effective Green, g (s)	47.0	38.0		39.0	33.0			43.0	49.0	53.0	53.0	64.0
Actuated g/C Ratio	0.43	0.35		0.35	0.30			0.39	0.45	0.48	0.48	0.58
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0	3.0	3.0	5.0	3.0
Vehicle Extension (s)	5.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	5.0
Lane Grp Cap (vph)	286	1599		162	1298			1094	524	214	1409	661
v/s Ratio Prot	c0.07	c0.24		0.03	0.18				0.02	c0.04	0.18	0.01
v/s Ratio Perm	0.22			0.16				c0.32	0.15	0.29		0.06
v/c Ratio	0.66	0.70		0.53	0.58			0.81	0.37	0.69	0.38	0.12
Uniform Delay, d1	21.5	31.1		25.0	32.7			29.8	20.3	19.2	18.1	10.3
Progression Factor	1.00	1.00		1.00	1.00			0.68	0.41	1.39	0.63	0.21
Incremental Delay, d2	7.5	1.4		3.3	1.9			6.0	0.4	8.3	0.7	0.2
Delay (s)	29.0	32.6		28.3	34.6			26.4	8.8	35.1	12.0	2.3
Level of Service	C	C		C	C			C	A	D	B	A
Approach Delay (s)		32.0			34.0			22.6			15.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	116.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1115: Ashland Ave. □ W Robinson St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↕	↗	↖	↕	↗
Volume (vph)	0	0	0	22	19	9	170	975	23	29	530	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	14	12	12	11	12	11	11	12	12	12	12
Total Lost time (s)					4.0	4.0	3.0	4.0		3.0	4.0	
Lane Util. Factor					1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes					1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes					0.99	1.00	0.99	1.00		1.00	1.00	
Frt					1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected					0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1593	1505	1264	3078		1708	3020	
Flt Permitted					0.97	1.00	0.41	1.00		0.25	1.00	
Satd. Flow (perm)					1593	1505	543	3078		458	3020	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	24	21	10	187	1071	25	32	582	5
RTOR Reduction (vph)	0	0	0	0	0	9	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	45	1	187	1095	0	32	587	0
Confl. Peds. (#/hr)	1		5	5		1	17		6	6		17
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	11%	0%	30%	7%	4%	0%	13%	20%
Turn Type				Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases					8		5	2		1		6
Permitted Phases				8		8	2			6		
Actuated Green, G (s)					7.4	7.4	94.6	88.0		87.0		83.4
Effective Green, g (s)					7.4	7.4	94.6	88.0		87.0		83.4
Actuated g/C Ratio					0.07	0.07	0.86	0.80		0.79		0.76
Clearance Time (s)					4.0	4.0	3.0	4.0		3.0		4.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0		3.0		3.0
Lane Grp Cap (vph)					107	101	520	2462		403		2289
v/s Ratio Prot							c0.03	c0.36		0.00		0.19
v/s Ratio Perm					0.03	0.00	0.28			0.06		
v/c Ratio					0.42	0.01	0.36	0.44		0.08		0.26
Uniform Delay, d1					49.2	47.9	1.4	3.4		2.5		4.0
Progression Factor					1.00	1.00	0.80	0.68		0.60		0.61
Incremental Delay, d2					2.7	0.0	0.4	0.6		0.1		0.3
Delay (s)					51.9	47.9	1.5	2.9		1.6		2.7
Level of Service					D	D	A	A		A		A
Approach Delay (s)		0.0			51.2			2.7				2.6
Approach LOS		A			D			A				A

Intersection Summary

HCM 2000 Control Delay	4.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1118: Ashland Ave. □ W 33rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	27	28	11	0	26	1	714	5	7	485	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)	4.0	4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99			0.99			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	0.92			0.90			1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.99			1.00		0.95	1.00	
Satd. Flow (prot)	1674	1649			1399			2434		1395	2726	
Flt Permitted	0.78	1.00			0.94			0.95		0.31	1.00	
Satd. Flow (perm)	1379	1649			1335			2324		461	2726	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	48	30	31	12	0	29	1	785	5	8	533	0
RTOR Reduction (vph)	0	22	0	0	21	0	0	0	0	0	0	0
Lane Group Flow (vph)	48	39	0	0	20	0	0	791	0	8	533	0
Confl. Peds. (#/hr)	1		3	3		1	3		3	3		3
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	19%	0%	12%	0%	14%	14%	0%
Parking (#/hr)								50				4
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.0	31.0			31.0			71.0		71.0	71.0	
Effective Green, g (s)	31.0	31.0			31.0			71.0		71.0	71.0	
Actuated g/C Ratio	0.28	0.28			0.28			0.65		0.65	0.65	
Clearance Time (s)	4.0	4.0			4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	388	464			376			1500		297	1759	
v/s Ratio Prot		0.02									0.20	
v/s Ratio Perm	c0.03				0.02			c0.34		0.02		
v/c Ratio	0.12	0.08			0.05			0.53		0.03	0.30	
Uniform Delay, d1	29.4	29.1			28.8			10.5		7.0	8.6	
Progression Factor	1.00	1.00			1.00			0.17		0.40	0.45	
Incremental Delay, d2	0.7	0.4			0.3			1.1		0.2	0.4	
Delay (s)	30.0	29.4			29.1			2.9		3.0	4.3	
Level of Service	C	C			C			A		A	A	
Approach Delay (s)		29.7			29.1			2.9			4.3	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1121: Ashland Ave. □ W 35th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	171	50	33	132	91	38	779	37	113	435	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.95	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1559	1514	1230	1543	1348	1120	1413	2545	977	1437	2494	1003
Flt Permitted	0.60	1.00	1.00	0.56	1.00	1.00	0.48	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	986	1514	1230	913	1348	1120	712	2545	977	357	2494	1003
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	52	188	55	36	145	100	42	856	41	124	478	12
RTOR Reduction (vph)	0	0	31	0	2	63	0	0	20	0	0	5
Lane Group Flow (vph)	52	188	24	36	153	27	42	856	21	124	478	7
Confl. Peds. (#/hr)	3		4	4		3	10		8	8		10
Confl. Bikes (#/hr)						1			2			3
Heavy Vehicles (%)	2%	11%	14%	3%	17%	19%	16%	13%	3%	15%	14%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								32	32		36	36
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	33.0	33.0	33.0	33.0	33.0	33.0	60.6	56.2	56.2	68.0	60.6	60.6
Effective Green, g (s)	33.0	33.0	33.0	33.0	33.0	33.0	60.6	56.2	56.2	68.0	60.6	60.6
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.55	0.51	0.51	0.62	0.55	0.55
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	295	454	369	273	404	336	420	1300	499	307	1373	552
v/s Ratio Prot		c0.12			0.11		0.00	c0.34		c0.03	0.19	
v/s Ratio Perm	0.05		0.02	0.04		0.02	0.05		0.02	0.22		0.01
v/c Ratio	0.18	0.41	0.07	0.13	0.38	0.08	0.10	0.66	0.04	0.40	0.35	0.01
Uniform Delay, d1	28.5	30.8	27.5	28.1	30.4	27.6	11.4	19.8	13.4	10.5	13.7	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.24	1.24	1.00
Incremental Delay, d2	1.3	2.8	0.3	1.0	2.7	0.5	0.1	2.6	0.2	0.9	0.7	0.0
Delay (s)	29.8	33.5	27.8	29.1	33.1	28.1	11.5	22.5	13.6	13.9	17.7	11.2
Level of Service	C	C	C	C	C	C	B	C	B	B	B	B
Approach Delay (s)		31.8			31.0			21.6			16.8	
Approach LOS		C			C			C			B	

Intersection Summary	
HCM 2000 Control Delay	22.9
HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55
Actuated Cycle Length (s)	110.0
Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%
ICU Level of Service	C
Analysis Period (min)	15
c Critical Lane Group	

HCM Signalized Intersection Capacity Analysis

1123: Ashland Ave. □ W 37th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	33	13	32	10	2	17	36	1061	20	29	516	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		1.00	1.00	
Frt		0.94			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1637			1121		1426	2846		1286	2820	
Flt Permitted		0.86			0.90		0.43	1.00		0.22	1.00	
Satd. Flow (perm)		1430			1031		645	2846		295	2820	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	36	14	35	11	2	19	40	1166	22	32	567	22
RTOR Reduction (vph)	0	31	0	0	17	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	54	0	0	15	0	40	1187	0	32	587	0
Confl. Peds. (#/hr)	10		2	2		10	7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	20%	0%	59%	11%	10%	10%	24%	11%	0%
Parking (#/hr)								0				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.1			9.1		56.9	56.9		56.9	56.9	
Effective Green, g (s)		9.1			9.1		56.9	56.9		56.9	56.9	
Actuated g/C Ratio		0.12			0.12		0.76	0.76		0.76	0.76	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		173			125		489	2159		223	2139	
v/s Ratio Prot								c0.42				0.21
v/s Ratio Perm		c0.04			0.01		0.06			0.11		
v/c Ratio		0.31			0.12		0.08	0.55		0.14	0.27	
Uniform Delay, d1		30.1			29.4		2.3	3.7		2.5	2.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.2			0.9		0.3	1.0		1.3	0.3	
Delay (s)		32.3			30.3		2.7	4.8		3.8	3.1	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		32.3			30.3			4.7			3.1	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1127: Ashland Ave. □ W Pershing Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	265	111	107	253	112	92	101	132	81	78	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	12	12	12	11	12	13
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1437	2952	1345	1322	2802	992	1676	1246	1139	1413	1266	1184
Flt Permitted	0.58	1.00	1.00	0.51	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	879	2952	1345	707	2802	992	1676	1246	1139	1413	1266	1184
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	22	291	122	118	278	123	101	111	145	89	86	24
RTOR Reduction (vph)	0	0	70	0	0	63	0	0	113	0	0	21
Lane Group Flow (vph)	22	291	52	118	278	60	101	111	32	89	86	3
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)						1						3
Heavy Vehicles (%)	15%	12%	10%	25%	18%	46%	2%	30%	17%	17%	28%	14%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	39.3	36.5	36.5	47.5	41.7	41.7	18.6	18.6	18.6	9.9	9.9	9.9
Effective Green, g (s)	39.3	36.5	36.5	47.5	41.7	41.7	18.6	18.6	18.6	9.9	9.9	9.9
Actuated g/C Ratio	0.46	0.43	0.43	0.56	0.49	0.49	0.22	0.22	0.22	0.12	0.12	0.12
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	424	1267	577	452	1374	486	366	272	249	164	147	137
v/s Ratio Prot	0.00	0.10		c0.02	0.10		0.06	c0.09		0.06	c0.07	
v/s Ratio Perm	0.02		0.04	c0.12		0.06			0.03			0.00
v/c Ratio	0.05	0.23	0.09	0.26	0.20	0.12	0.28	0.41	0.13	0.54	0.59	0.02
Uniform Delay, d1	12.5	15.4	14.4	9.2	12.2	11.7	27.6	28.5	26.7	35.4	35.6	33.3
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
Incremental Delay, d2	0.1	0.4	0.3	0.3	0.3	0.5	1.9	4.5	1.1	3.6	5.8	0.1
Delay (s)	12.5	15.8	14.7	9.5	12.6	12.3	29.5	33.0	27.7	39.0	41.4	33.3
Level of Service	B	B	B	A	B	B	C	C	C	D	D	C
Approach Delay (s)		15.3			11.8			29.8			39.4	
Approach LOS		B			B			C			D	

Intersection Summary		
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.35	C
Actuated Cycle Length (s)	85.0	Sum of lost time (s)
Intersection Capacity Utilization	36.0%	12.0
Analysis Period (min)	15	ICU Level of Service
		A
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 1130: Ashland Ave. □ W 42nd St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	81	33	7	990	386	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	11	12
Total Lost time (s)	5.0		3.0	3.0	3.0	3.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1534		1706	2698	3061	1345
Flt Permitted	0.97		0.46	1.00	1.00	1.00
Satd. Flow (perm)	1534		820	2698	3061	1345
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	89	36	8	1088	424	34
RTOR Reduction (vph)	17	0	0	0	0	12
Lane Group Flow (vph)	108	0	8	1088	424	22
Confl. Peds. (#/hr)	2	1	4			4
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	2%	12%	0%	6%	8%	10%
Parking (#/hr)				34		
Turn Type	NA		custom	NA	NA	Perm
Protected Phases	4		5 9	2 9	6	
Permitted Phases			2			6
Actuated Green, G (s)	17.0		70.0	73.0	58.8	58.8
Effective Green, g (s)	17.0		70.0	73.0	58.8	58.8
Actuated g/C Ratio	0.17		0.70	0.73	0.59	0.59
Clearance Time (s)	5.0				3.0	3.0
Vehicle Extension (s)	8.0				3.0	3.0
Lane Grp Cap (vph)	260		646	1969	1799	790
v/s Ratio Prot	c0.07		0.00	c0.40	0.14	
v/s Ratio Perm			0.01			0.02
v/c Ratio	0.41		0.01	0.55	0.24	0.03
Uniform Delay, d1	37.1		4.7	6.1	9.9	8.6
Progression Factor	1.00		0.01	0.00	1.00	1.00
Incremental Delay, d2	4.5		0.0	0.2	0.3	0.1
Delay (s)	41.6		0.0	0.3	10.2	8.7
Level of Service	D		A	A	B	A
Approach Delay (s)	41.6			0.3	10.1	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1131: Ashland Ave. □ W 42nd Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕↔		↕	↕↔	
Volume (vph)	7	0	5	2	0	2	3	1131	0	6	649	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	8	12	12	12	11	11	11	11	12
Total Lost time (s)		5.0			5.0			3.0		5.0	3.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.95			0.93			1.00		1.00	1.00	
Flt Protected		0.97			0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1656			1092			2963		990	2825	
Flt Permitted		0.89			0.93			0.95		0.17	1.00	
Satd. Flow (perm)		1519			1041			2827		178	2825	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	8	0	5	2	0	2	3	1243	0	7	713	3
RTOR Reduction (vph)	0	11	0	0	3	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	1	0	0	1246	0	7	716	0
Confl. Peds. (#/hr)								13		5	5	13
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	0%	0%	0%	50%	0%	50%	0%	6%	0%	67%	11%	33%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2		13	6	13
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.0			17.0			63.0		65.8	68.8	
Effective Green, g (s)		17.0			17.0			63.0		65.8	68.8	
Actuated g/C Ratio		0.17			0.17			0.63		0.66	0.69	
Clearance Time (s)		5.0			5.0			3.0		5.0		
Vehicle Extension (s)		8.0			8.0			3.0		3.0		
Lane Grp Cap (vph)		258			176			1781		173	1943	
v/s Ratio Prot										0.00	c0.25	
v/s Ratio Perm		c0.00			0.00			c0.44		0.02		
v/c Ratio		0.01			0.00			0.70		0.04	0.37	
Uniform Delay, d1		34.5			34.5			12.2		12.0	6.5	
Progression Factor		1.00			1.00			0.47		0.48	0.50	
Incremental Delay, d2		0.1			0.0			2.2		0.1	0.1	
Delay (s)		34.6			34.5			8.0		5.8	3.4	
Level of Service		C			C			A		A	A	
Approach Delay (s)		34.6			34.5			8.0			3.4	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1132: Ashland Ave. □ W 43rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	124	28	23	75	66	62	721	60	63	343	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	12	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1518	1449		1446	1461	1258	1594	2797	948	1355	2648	861
Flt Permitted	0.70	1.00		0.59	1.00	1.00	0.51	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	1125	1449		901	1461	1258	863	2797	948	403	2648	861
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	116	136	31	25	82	73	68	792	66	69	377	80
RTOR Reduction (vph)	0	8	0	0	0	53	0	0	26	0	0	37
Lane Group Flow (vph)	116	159	0	25	82	20	68	792	40	69	377	43
Confl. Peds. (#/hr)	1		14	14		1	8		1	1		8
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	14%	4%	9%	15%	12%	3%	4%	12%	22%	8%	16%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								28	28		34	34
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	27.0	27.0		27.0	27.0	27.0	60.6	53.1	53.1	61.4	53.5	53.5
Effective Green, g (s)	27.0	27.0		27.0	27.0	27.0	60.6	53.1	53.1	61.4	53.5	53.5
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27	0.61	0.53	0.53	0.61	0.54	0.54
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	303	391		243	394	339	577	1485	503	322	1416	460
v/s Ratio Prot		c0.11			0.06		0.01	c0.28		c0.02	0.14	
v/s Ratio Perm	0.10			0.03		0.02	0.06		0.04	0.11		0.05
v/c Ratio	0.38	0.41		0.10	0.21	0.06	0.12	0.53	0.08	0.21	0.27	0.09
Uniform Delay, d1	29.7	29.9		27.4	28.2	27.1	8.1	15.3	11.5	8.5	12.6	11.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.46	0.88	0.80	0.76	0.60	0.25
Incremental Delay, d2	3.6	3.1		0.8	1.2	0.3	0.2	1.2	0.3	0.7	0.4	0.4
Delay (s)	33.4	33.0		28.3	29.4	27.4	3.9	14.8	9.5	7.1	8.0	3.3
Level of Service	C	C		C	C	C	A	B	A	A	A	A
Approach Delay (s)		33.2			28.4			13.6			7.2	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1133: Ashland Ave. □ W 44th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	31	9	15	21	5	9	14	962	37	40	532	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	11	10	11	11
Total Lost time (s)		5.0			5.0		4.0	4.0		3.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.97			1.00		0.99	1.00		1.00	1.00	
Frt		0.96			0.96		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1602			1441		1383	2848		1451	2524	
Flt Permitted		0.80			0.83		0.42	1.00		0.22	1.00	
Satd. Flow (perm)		1323			1239		612	2848		342	2524	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	34	10	16	23	5	10	15	1057	41	44	585	27
RTOR Reduction (vph)	0	15	0	0	9	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	45	0	0	29	0	15	1097	0	44	610	0
Confl. Peds. (#/hr)	16		2	2		16	9		2	2		9
Heavy Vehicles (%)	0%	0%	7%	5%	0%	44%	14%	5%	3%	10%	10%	4%
Parking (#/hr)								16			42	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.1			9.1		75.0	75.0		81.9	81.9	
Effective Green, g (s)		9.1			9.1		75.0	75.0		81.9	81.9	
Actuated g/C Ratio		0.09			0.09		0.75	0.75		0.82	0.82	
Clearance Time (s)		5.0			5.0		4.0	4.0		3.0	4.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		120			112		459	2136		323	2067	
v/s Ratio Prot								c0.39		0.01	c0.24	
v/s Ratio Perm		c0.03			0.02		0.02			0.11		
v/c Ratio		0.38			0.26		0.03	0.51		0.14	0.30	
Uniform Delay, d1		42.8			42.3		3.2	5.1		2.3	2.2	
Progression Factor		1.00			1.00		0.28	0.20		1.58	2.25	
Incremental Delay, d2		4.1			2.6		0.1	0.8		0.2	0.4	
Delay (s)		46.9			44.9		1.0	1.8		3.9	5.2	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		46.9			44.9			1.8			5.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1134: Ashland Ave. □ W 45th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	35	9	15	15	8	22	10	790	28	19	383	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		1.00	1.00	
Frt		0.97			0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1632			1556		1429	2632		1588	2515	
Flt Permitted		0.84			0.92		0.48	1.00		0.27	1.00	
Satd. Flow (perm)		1409			1458		721	2632		452	2515	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	38	10	16	16	9	24	11	868	31	21	421	29
RTOR Reduction (vph)	0	12	0	0	17	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	52	0	0	32	0	11	896	0	21	445	0
Confl. Peds. (#/hr)	15		10	10		15	9		7	7		9
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	0%	0%	7%	13%	0%	0%	10%	6%	7%	0%	11%	0%
Parking (#/hr)								40				40
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.0			28.0		63.0	63.0		63.0	63.0	
Effective Green, g (s)		28.0			28.0		63.0	63.0		63.0	63.0	
Actuated g/C Ratio		0.28			0.28		0.63	0.63		0.63	0.63	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		394			408		454	1658		284	1584	
v/s Ratio Prot								c0.34				0.18
v/s Ratio Perm		c0.04			0.02		0.02			0.05		
v/c Ratio		0.13			0.08		0.02	0.54		0.07	0.28	
Uniform Delay, d1		26.9			26.5		7.0	10.4		7.2	8.3	
Progression Factor		1.00			1.00		1.09	1.17		0.55	0.80	
Incremental Delay, d2		0.7			0.4		0.1	1.1		0.5	0.4	
Delay (s)		27.6			26.9		7.7	13.3		4.4	7.1	
Level of Service		C			C		A	B		A	A	
Approach Delay (s)		27.6			26.9			13.2			7.0	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1135: Ashland Ave. □ W 46th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	31	17	10	4	9	38	13	761	15	48	340	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		0.97	1.00		0.98	1.00	
Frt		0.98			0.90		1.00	1.00		1.00	0.99	
Flt Protected		0.97			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1662			1517		1556	2654		1541	2405	
Flt Permitted		0.86			0.99		0.51	1.00		0.29	1.00	
Satd. Flow (perm)		1470			1505		832	2654		471	2405	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	34	19	11	4	10	42	14	836	16	53	374	29
RTOR Reduction (vph)	0	7	0	0	30	0	0	1	0	0	6	0
Lane Group Flow (vph)	0	57	0	0	26	0	14	851	0	53	397	0
Confl. Peds. (#/hr)	13		5	5		13	11		18	18		11
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	10%	0%	0%	5%	0%	6%	7%	2%	13%	4%
Parking (#/hr)								38			48	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio		0.28			0.28		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		411			421		532	1698		301	1539	
v/s Ratio Prot								c0.32				0.17
v/s Ratio Perm		c0.04			0.02		0.02			0.11		
v/c Ratio		0.14			0.06		0.03	0.50		0.18	0.26	
Uniform Delay, d1		27.0			26.4		6.6	9.5		7.3	7.8	
Progression Factor		1.00			1.00		0.94	0.91		1.88	1.71	
Incremental Delay, d2		0.7			0.3		0.1	1.0		1.2	0.4	
Delay (s)		27.7			26.7		6.3	9.7		15.0	13.7	
Level of Service		C			C		A	A		B	B	
Approach Delay (s)		27.7			26.7			9.6			13.8	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1136: Ashland Ave. □ W 47th St. □ S. McDowell Ave.

8/8/2013



Movement	EBL2	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR2	SBL	SBT
Lane Configurations	↗	↑↑		↗	↑↑			↗	↑↑	↗	↗	↑↑
Volume (vph)	99	251	40	59	226	48	7	47	544	88	56	238
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	11	11	11
Total Lost time (s)	3.0	5.0		3.0	5.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00	1.00	0.95
Frbp, ped/bikes	1.00	0.99		1.00	0.99			1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.95	1.00	1.00	0.98	1.00
Frt	1.00	0.98		1.00	0.97			1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1412	2705		1504	2703			1510	2607	1409	1398	2804
Flt Permitted	0.53	1.00		0.55	1.00			0.58	1.00	1.00	0.35	1.00
Satd. Flow (perm)	783	2705		878	2703			927	2607	1409	522	2804
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	109	276	44	65	248	53	8	52	598	97	62	262
RTOR Reduction (vph)	0	12	0	0	2	0	0	0	0	53	0	0
Lane Group Flow (vph)	109	308	0	65	307	0	0	52	598	44	62	262
Confl. Peds. (#/hr)			27	27		51		44			33	
Heavy Vehicles (%)	13%	16%	8%	5%	13%	15%	0%	4%	4%	5%	16%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)									52			0
Turn Type	pm+pt	NA		pm+pt	NA			Perm	NA	Perm	Perm	NA
Protected Phases	7	4		3	8				2			6
Permitted Phases	4			8				2		2	6	
Actuated Green, G (s)	43.8	37.8		41.4	36.6			45.4	45.4	45.4	45.4	45.4
Effective Green, g (s)	43.8	37.8		41.4	36.6			45.4	45.4	45.4	45.4	45.4
Actuated g/C Ratio	0.44	0.38		0.41	0.37			0.45	0.45	0.45	0.45	0.45
Clearance Time (s)	3.0	5.0		3.0	5.0			4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	380	1022		393	989			420	1183	639	236	1273
v/s Ratio Prot	c0.02	c0.11		0.01	0.11				c0.23			0.09
v/s Ratio Perm	0.11			0.06				0.06		0.03	0.12	
v/c Ratio	0.29	0.30		0.17	0.31			0.12	0.51	0.07	0.26	0.21
Uniform Delay, d1	17.1	21.8		17.9	22.7			15.8	19.3	15.4	16.9	16.4
Progression Factor	1.00	1.00		1.00	1.00			1.06	0.98	1.61	1.38	1.41
Incremental Delay, d2	0.4	0.8		0.2	0.8			0.5	1.3	0.2	2.6	0.4
Delay (s)	17.6	22.6		18.1	23.5			17.3	20.3	24.9	26.0	23.5
Level of Service	B	C		B	C			B	C	C	C	C
Approach Delay (s)		21.3			22.6				20.7			25.5
Approach LOS		C			C				C			C

Intersection Summary

HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1136: Ashland Ave. □ W 47th St. □ S. McDowell Ave.

8/8/2013



Movement	SBR	SWR2
Lane Configurations	↗	↗
Volume (vph)	59	4
Ideal Flow (vphpl)	1800	1800
Lane Width	11	12
Total Lost time (s)	4.0	5.0
Lane Util. Factor	1.00	1.00
Frbp, ped/bikes	0.92	1.00
Flpb, ped/bikes	1.00	1.00
Frt	0.85	0.86
Flt Protected	1.00	1.00
Satd. Flow (prot)	1073	1557
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1073	1557
Peak-hour factor, PHF	0.91	0.91
Adj. Flow (vph)	65	4
RTOR Reduction (vph)	35	3
Lane Group Flow (vph)	30	1
Confl. Peds. (#/hr)	44	
Heavy Vehicles (%)	10%	0%
Bus Blockages (#/hr)	8	0
Parking (#/hr)	0	
Turn Type	Perm	custom
Protected Phases		
Permitted Phases	6	8
Actuated Green, G (s)	45.4	36.6
Effective Green, g (s)	45.4	36.6
Actuated g/C Ratio	0.45	0.37
Clearance Time (s)	4.0	5.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	487	569
v/s Ratio Prot		
v/s Ratio Perm	0.03	0.00
v/c Ratio	0.06	0.00
Uniform Delay, d1	15.3	20.1
Progression Factor	2.16	1.00
Incremental Delay, d2	0.2	0.0
Delay (s)	33.4	20.1
Level of Service	C	C
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

1137: Ashland Ave. □ W 48th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↔		↗	↕			↖		
Volume (vph)	0	0	0	15	26	16	46	902	0	0	340	41	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	12	12	12	10	11	12	12	11	12	
Total Lost time (s)					5.0		4.0	4.0			4.0		
Lane Util. Factor					1.00		1.00	0.95			0.95		
Frbp, ped/bikes					0.98		1.00	1.00			0.99		
Flpb, ped/bikes					0.98		0.96	1.00			1.00		
Frt					0.96		1.00	1.00			0.98		
Flt Protected					0.99		0.95	1.00			1.00		
Satd. Flow (prot)					1542		1406	2734			2488		
Flt Permitted					0.99		0.50	1.00			1.00		
Satd. Flow (perm)					1542		743	2734			2488		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	16	29	18	51	991	0	0	374	45	
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	9	0	
Lane Group Flow (vph)	0	0	0	0	49	0	51	991	0	0	410	0	
Confl. Peds. (#/hr)	33		56	56		33	19		2	2		19	
Confl. Bikes (#/hr)												2	
Heavy Vehicles (%)	0%	0%	0%	0%	8%	12%	9%	4%	0%	0%	7%	5%	
Parking (#/hr)								36			50		
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8			2						
Actuated Green, G (s)					24.0		67.0	67.0			67.0		
Effective Green, g (s)					24.0		67.0	67.0			67.0		
Actuated g/C Ratio					0.24		0.67	0.67			0.67		
Clearance Time (s)					5.0		4.0	4.0			4.0		
Lane Grp Cap (vph)					370		497	1831			1666		
v/s Ratio Prot								c0.36			0.16		
v/s Ratio Perm					0.03		0.07						
v/c Ratio					0.13		0.10	0.54			0.25		
Uniform Delay, d1					29.8		5.8	8.5			6.5		
Progression Factor					1.00		0.69	0.56			0.75		
Incremental Delay, d2					0.7		0.4	1.1			0.3		
Delay (s)					30.6		4.4	5.9			5.2		
Level of Service					C		A	A			A		
Approach Delay (s)		0.0			30.6			5.8			5.2		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			6.7		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.43										
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			53.0%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1138: Ashland Ave. □ W 49th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	47	27	30	15	14	10	10	669	23	17	264	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.96			0.96		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1672			1652		1580	2630		1572	2486	
Flt Permitted		0.86			0.89		0.56	1.00		0.33	1.00	
Satd. Flow (perm)		1464			1504		937	2630		553	2486	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	52	30	33	16	15	11	11	735	25	19	290	20
RTOR Reduction (vph)	0	14	0	0	8	0	0	2	0	0	5	0
Lane Group Flow (vph)	0	101	0	0	34	0	11	758	0	19	305	0
Confl. Peds. (#/hr)	5					5	4		14	14		4
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	2%	0%	0%	7%	0%	0%	0%	5%	0%	0%	9%	0%
Parking (#/hr)								44				50
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0			24.0		67.0	67.0		67.0	67.0	
Effective Green, g (s)		24.0			24.0		67.0	67.0		67.0	67.0	
Actuated g/C Ratio		0.24			0.24		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		351			360		627	1762		370	1665	
v/s Ratio Prot								c0.29				0.12
v/s Ratio Perm		c0.07			0.02		0.01			0.03		
v/c Ratio		0.29			0.09		0.02	0.43		0.05	0.18	
Uniform Delay, d1		31.0			29.5		5.5	7.6		5.6	6.2	
Progression Factor		1.00			1.00		0.63	0.47		0.19	0.15	
Incremental Delay, d2		2.0			0.5		0.0	0.7		0.3	0.2	
Delay (s)		33.1			30.1		3.5	4.3		1.3	1.2	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		33.1			30.1			4.3			1.2	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1139: Ashland Ave. □ W 50th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	26	15	8	17	15	26	5	705	6	22	289	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			0.99		0.98	1.00		0.99	1.00	
Frt		0.98			0.94		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1680			1622		1571	2617		1585	2795	
Flt Permitted		0.85			0.92		0.55	1.00		0.32	1.00	
Satd. Flow (perm)		1474			1523		913	2617		535	2795	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	29	16	9	19	16	29	5	775	7	24	318	13
RTOR Reduction (vph)	0	7	0	0	21	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	47	0	0	43	0	5	781	0	24	328	0
Confl. Peds. (#/hr)	19		26	26		19	8		8	8		8
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	12%	0%
Parking (#/hr)								44				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.0			26.0		65.0	65.0		65.0	65.0	
Effective Green, g (s)		26.0			26.0		65.0	65.0		65.0	65.0	
Actuated g/C Ratio		0.26			0.26		0.65	0.65		0.65	0.65	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		383			395		593	1701		347	1816	
v/s Ratio Prot								c0.30				0.12
v/s Ratio Perm		c0.03			0.03		0.01			0.04		
v/c Ratio		0.12			0.11		0.01	0.46		0.07	0.18	
Uniform Delay, d1		28.3			28.2		6.2	8.7		6.4	6.9	
Progression Factor		1.00			1.00		0.81	0.67		0.67	0.64	
Incremental Delay, d2		0.7			0.5		0.0	0.9		0.4	0.2	
Delay (s)		29.0			28.7		5.0	6.7		4.7	4.7	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		29.0			28.7			6.7			4.7	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1140: Ashland Ave. □ W 51st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	288	29	46	177	55	31	505	58	29	221	37
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1525	1541	1289	1519	1570	1306	1546	2568	848	1487	2372	834
Flt Permitted	0.58	1.00	1.00	0.42	1.00	1.00	0.60	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	929	1541	1289	667	1570	1306	977	2568	848	617	2372	834
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	116	316	32	51	195	60	34	555	64	32	243	41
RTOR Reduction (vph)	0	0	18	0	0	40	0	1	25	0	0	18
Lane Group Flow (vph)	116	316	14	51	195	20	34	560	33	32	243	23
Confl. Peds. (#/hr)	5		12	12		5	4		14	14		4
Heavy Vehicles (%)	4%	9%	7%	4%	7%	7%	6%	4%	2%	10%	15%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								42	42		50	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	34.0	34.0	34.0	34.0	34.0	34.0	57.0	57.0	57.0	57.0	57.0	57.0
Effective Green, g (s)	34.0	34.0	34.0	34.0	34.0	34.0	57.0	57.0	57.0	57.0	57.0	57.0
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	315	523	438	226	533	444	556	1463	483	351	1352	475
v/s Ratio Prot		c0.21			0.12			c0.22			0.10	
v/s Ratio Perm	0.12		0.01	0.08		0.02	0.03		0.04	0.05		0.03
v/c Ratio	0.37	0.60	0.03	0.23	0.37	0.05	0.06	0.38	0.07	0.09	0.18	0.05
Uniform Delay, d1	24.9	27.4	22.0	23.6	24.9	22.1	9.6	11.8	9.6	9.8	10.3	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.07	1.06	1.71
Incremental Delay, d2	3.3	5.1	0.1	2.3	1.9	0.2	0.2	0.8	0.3	0.5	0.3	0.2
Delay (s)	28.2	32.5	22.1	25.9	26.8	22.3	9.8	12.6	9.9	10.9	11.3	16.5
Level of Service	C	C	C	C	C	C	A	B	A	B	B	B
Approach Delay (s)		30.7			25.8			12.2			11.9	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1142: Ashland Ave. □ W 53rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↗	↕		↗	↕	
Volume (vph)	0	0	0	9	5	13	10	659	0	6	250	13
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	11	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)					5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes					0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					0.99		1.00	1.00		0.99	1.00	
Frt					0.93		1.00	1.00		1.00	0.99	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1518		1444	2734		1346	2438	
Flt Permitted					0.98		0.57	1.00		0.34	1.00	
Satd. Flow (perm)					1518		874	2734		481	2438	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	10	5	14	11	724	0	7	275	14
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	0	0	19	0	11	724	0	7	285	0
Confl. Peds. (#/hr)	2		13	13		2	2		13	13		2
Heavy Vehicles (%)	0%	0%	0%	11%	0%	8%	10%	4%	0%	17%	11%	23%
Parking (#/hr)								36			48	
Turn Type				Perm	NA		Perm	NA		Perm	NA	
Protected Phases					8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)					26.0		55.0	55.0		55.0	55.0	
Effective Green, g (s)					26.0		55.0	55.0		55.0	55.0	
Actuated g/C Ratio					0.29		0.61	0.61		0.61	0.61	
Clearance Time (s)					5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)					438		534	1670		293	1489	
v/s Ratio Prot								c0.26			0.12	
v/s Ratio Perm					0.01		0.01			0.01		
v/c Ratio					0.04		0.02	0.43		0.02	0.19	
Uniform Delay, d1					23.0		6.9	9.3		6.9	7.7	
Progression Factor					1.00		0.17	0.12		1.00	1.00	
Incremental Delay, d2					0.2		0.1	0.8		0.2	0.3	
Delay (s)					23.2		1.2	1.9		7.1	8.0	
Level of Service					C		A	A		A	A	
Approach Delay (s)		0.0			23.2			1.9			8.0	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			4.2		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)					9.0		
Intersection Capacity Utilization			45.9%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1144: Ashland Ave. □ W Garfield Blvd. (WB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↑↑	↗	↙	↑↑			↑↑	↗
Volume (vph)	0	0	0	138	656	29	121	614	0	0	241	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	9	10	10	9	11	11	10	10	10
Total Lost time (s)				5.0	5.0	5.0	5.0	3.0			3.0	3.0
Lane Util. Factor				1.00	0.95	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes				1.00	1.00	0.94	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	0.99	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1524	3069	1339	1472	2963			2437	937
Flt Permitted				0.95	1.00	1.00	0.57	1.00			1.00	1.00
Satd. Flow (perm)				1524	3069	1339	876	2963			2437	937
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	152	721	32	133	675	0	0	265	45
RTOR Reduction (vph)	0	0	0	0	0	20	0	0	0	0	0	27
Lane Group Flow (vph)	0	0	0	152	721	12	133	675	0	0	265	19
Confl. Peds. (#/hr)	57					57	14		12	12		14
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	1%	4%	0%	4%	6%	0%	0%	12%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								0			38	38
Turn Type				Perm	NA	Perm	custom	NA			NA	Perm
Protected Phases					8		5	2.5			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)				35.0	35.0	35.0	42.0	45.0			37.0	37.0
Effective Green, g (s)				35.0	35.0	35.0	42.0	45.0			37.0	37.0
Actuated g/C Ratio				0.39	0.39	0.39	0.47	0.50			0.41	0.41
Clearance Time (s)				5.0	5.0	5.0	5.0				3.0	3.0
Lane Grp Cap (vph)				592	1193	520	441	1481			1001	385
v/s Ratio Prot					c0.23		0.02	c0.23			0.11	
v/s Ratio Perm				0.10		0.01	0.12					0.02
v/c Ratio				0.26	0.60	0.02	0.30	0.46			0.26	0.05
Uniform Delay, d1				18.7	22.0	17.0	15.9	14.6			17.5	15.9
Progression Factor				1.00	1.00	1.00	0.24	0.23			1.16	6.62
Incremental Delay, d2				1.0	2.3	0.1	1.5	0.9			0.6	0.2
Delay (s)				19.7	24.2	17.0	5.4	4.3			20.9	105.7
Level of Service				B	C	B	A	A			C	F
Approach Delay (s)		0.0			23.2			4.5			33.2	
Approach LOS		A			C			A			C	

Intersection Summary

HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1145: Ashland Ave. □ W Garfield Blvd. (EB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↑↑	↵					↑↑	↵	↵	↑↑	
Volume (vph)	62	866	61	0	0	0	0	618	153	69	317	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	10	10	10	11	11	10	9	11	11
Total Lost time (s)	5.0	5.0	5.0					3.0	3.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00					0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.95					1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1507	3011	1250					2745	1041	1479	2881	
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)	1507	3011	1250					2745	1041	445	2881	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	68	952	67	0	0	0	0	679	168	76	348	0
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	60	0	0	0
Lane Group Flow (vph)	68	952	30	0	0	0	0	679	108	76	348	0
Confl. Peds. (#/hr)	1		48	48		1	6		10	10		6
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	8%	0%	0%	0%	0%	6%	2%	4%	9%	0%
Parking (#/hr)								28	28		0	
Turn Type	Perm	NA	Perm					NA	Perm	custom	NA	
Protected Phases		4						2		1	16	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	35.0	35.0	35.0					37.0	37.0	42.0	45.0	
Effective Green, g (s)	35.0	35.0	35.0					37.0	37.0	42.0	42.0	
Actuated g/C Ratio	0.39	0.39	0.39					0.41	0.41	0.47	0.47	
Clearance Time (s)	5.0	5.0	5.0					3.0	3.0	5.0		
Lane Grp Cap (vph)	586	1170	486					1128	427	265	1344	
v/s Ratio Prot		c0.32						c0.25		c0.02	0.12	
v/s Ratio Perm	0.05		0.02						0.10	0.12		
v/c Ratio	0.12	0.81	0.06					0.60	0.25	0.29	0.26	
Uniform Delay, d1	17.6	24.6	17.2					20.7	17.4	21.4	14.6	
Progression Factor	1.00	1.00	1.00					0.41	0.51	0.98	0.87	
Incremental Delay, d2	0.4	6.3	0.2					2.0	1.2	2.7	0.5	
Delay (s)	18.0	30.8	17.5					10.6	10.0	23.7	13.1	
Level of Service	B	C	B					B	B	C	B	
Approach Delay (s)		29.2			0.0			10.5			15.0	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1148: Ashland Ave. □ W 57th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↕	↕	
Volume (vph)	22	9	33	0	0	0	0	846	12	6	342	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	10	11	11
Total Lost time (s)		5.0						4.0		4.0	4.0	
Lane Util. Factor		1.00						0.95		1.00	0.95	
Frbp, ped/bikes		0.98						1.00		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		0.99	1.00	
Frt		0.93						1.00		1.00	1.00	
Flt Protected		0.98						1.00		0.95	1.00	
Satd. Flow (prot)		1567						2693		1587	2541	
Flt Permitted		0.98						1.00		0.25	1.00	
Satd. Flow (perm)		1567						2693		416	2541	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	24	10	36	0	0	0	0	930	13	7	376	0
RTOR Reduction (vph)	0	25	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	45	0	0	0	0	0	942	0	7	376	0
Confl. Peds. (#/hr)	7		17	17		7	23		10	10		23
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	4%	8%	0%	8%	0%
Parking (#/hr)								40			48	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		27.0						54.0		54.0	54.0	
Effective Green, g (s)		27.0						54.0		54.0	54.0	
Actuated g/C Ratio		0.30						0.60		0.60	0.60	
Clearance Time (s)		5.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		470						1615		249	1524	
v/s Ratio Prot								0.35			0.15	
v/s Ratio Perm		0.03								0.02		
v/c Ratio		0.10						0.58		0.03	0.25	
Uniform Delay, d1		22.7						11.1		7.3	8.5	
Progression Factor		1.00						0.81		0.78	1.15	
Incremental Delay, d2		0.4						1.3		0.2	0.4	
Delay (s)		23.1						10.3		5.9	10.1	
Level of Service		C						B		A	B	
Approach Delay (s)		23.1			0.0			10.3			10.0	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1150: Ashland Ave. □ W 59th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	280	38	46	209	36	90	682	48	29	311	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.88	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1432	1514	1202	1491	1585	1290	1501	2813	1077	1491	2881	1076
Flt Permitted	0.56	1.00	1.00	0.51	1.00	1.00	0.52	1.00	1.00	0.25	1.00	1.00
Satd. Flow (perm)	842	1514	1202	793	1585	1290	814	2813	1077	396	2881	1076
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	82	308	42	51	230	40	99	749	53	32	342	47
RTOR Reduction (vph)	0	0	24	0	0	23	0	0	32	0	0	28
Lane Group Flow (vph)	82	308	18	51	230	17	99	749	21	32	342	19
Confl. Peds. (#/hr)	7		63	63		7	25		1	1		25
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	11%	11%	5%	4%	6%	8%	2%	4%	0%	7%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								26	26		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	43.2	39.2	39.2	41.2	38.2	38.2	35.8	35.8	35.8	35.8	35.8	35.8
Effective Green, g (s)	43.2	39.2	39.2	41.2	38.2	38.2	35.8	35.8	35.8	35.8	35.8	35.8
Actuated g/C Ratio	0.48	0.44	0.44	0.46	0.42	0.42	0.40	0.40	0.40	0.40	0.40	0.40
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	430	659	523	386	672	547	323	1118	428	157	1145	428
v/s Ratio Prot	c0.01	c0.20		0.00	0.15			c0.27			0.12	
v/s Ratio Perm	0.08		0.02	0.06		0.01	0.12		0.02	0.08		0.02
v/c Ratio	0.19	0.47	0.03	0.13	0.34	0.03	0.31	0.67	0.05	0.20	0.30	0.04
Uniform Delay, d1	13.0	18.0	14.6	13.8	17.4	15.1	18.6	22.2	16.6	17.8	18.5	16.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.36	0.38	0.25	1.44	1.25	3.15
Incremental Delay, d2	0.2	2.4	0.1	0.2	1.4	0.1	2.0	2.6	0.2	2.9	0.7	0.2
Delay (s)	13.2	20.4	14.7	14.0	18.8	15.2	8.7	10.9	4.4	28.4	23.9	52.5
Level of Service	B	C	B	B	B	B	A	B	A	C	C	D
Approach Delay (s)		18.5			17.6			10.3			27.4	
Approach LOS		B			B			B			C	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1152: Ashland Ave. □ W 61st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↕	↕	
Volume (vph)	26	25	80	0	0	0	0	852	40	6	395	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	16	16	16	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0		4.0	4.0	
Lane Util. Factor		1.00						0.95		1.00	0.95	
Frbp, ped/bikes		0.99						1.00		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		0.99	1.00	
Frt		0.92						0.99		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		1813						2766		1401	2495	
Flt Permitted		0.99						1.00		0.23	1.00	
Satd. Flow (perm)		1813						2766		338	2495	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	29	27	88	0	0	0	0	936	44	7	434	0
RTOR Reduction (vph)	0	60	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	84	0	0	0	0	0	976	0	7	434	0
Confl. Peds. (#/hr)	6		7	7			6	24		16	16	24
Heavy Vehicles (%)	4%	0%	0%	0%	0%	0%	0%	3%	2%	17%	8%	0%
Parking (#/hr)								32			54	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		29.0						52.0		52.0	52.0	
Effective Green, g (s)		29.0						52.0		52.0	52.0	
Actuated g/C Ratio		0.32						0.58		0.58	0.58	
Clearance Time (s)		5.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		584						1598		195	1441	
v/s Ratio Prot								c0.35			0.17	
v/s Ratio Perm		0.05								0.02		
v/c Ratio		0.14						0.61		0.04	0.30	
Uniform Delay, d1		21.7						12.4		8.2	9.7	
Progression Factor		1.00						0.35		1.13	1.03	
Incremental Delay, d2		0.5						1.5		0.3	0.5	
Delay (s)		22.2						5.9		9.6	10.6	
Level of Service		C						A		A	B	
Approach Delay (s)		22.2			0.0			5.9			10.5	
Approach LOS		C			A			A			B	

Intersection Summary

HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1154: Ashland Ave. □ W 63rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	439	75	54	358	35	165	737	101	60	374	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00		1.00	1.00	0.89	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.97	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1495	1514	1207	1453	1581		1499	3020	1099	1557	2534	
Flt Permitted	0.31	1.00	1.00	0.25	1.00		0.43	1.00	1.00	0.26	1.00	
Satd. Flow (perm)	489	1514	1207	388	1581		677	3020	1099	428	2534	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	57	482	82	59	393	38	181	810	111	66	411	64
RTOR Reduction (vph)	0	0	39	0	4	0	0	0	41	0	14	0
Lane Group Flow (vph)	57	482	43	59	427	0	181	810	70	66	461	0
Confl. Peds. (#/hr)	19		76	76		19	37		42	42		37
Heavy Vehicles (%)	6%	11%	9%	7%	5%	0%	5%	4%	4%	2%	8%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								0	0			36
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	33.0	33.0	33.0	33.0	33.0		45.0	40.0	40.0	43.0	39.0	
Effective Green, g (s)	33.0	33.0	33.0	33.0	33.0		45.0	40.0	40.0	43.0	39.0	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37		0.50	0.44	0.44	0.48	0.43	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	179	555	442	142	579		384	1342	488	254	1098	
v/s Ratio Prot		c0.32			0.27		c0.03	c0.27		0.01	0.18	
v/s Ratio Perm	0.12		0.04	0.15			0.21		0.06	0.11		
v/c Ratio	0.32	0.87	0.10	0.42	0.74		0.47	0.60	0.14	0.26	0.42	
Uniform Delay, d1	20.4	26.5	18.7	21.3	24.7		13.5	19.0	14.8	13.4	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.39	1.25	1.91	2.20	1.93	
Incremental Delay, d2	4.6	16.7	0.4	8.7	8.2		0.8	1.9	0.6	0.5	1.2	
Delay (s)	25.1	43.2	19.2	30.0	32.9		19.7	25.6	28.9	30.0	35.2	
Level of Service	C	D	B	C	C		B	C	C	C	D	
Approach Delay (s)		38.4			32.6			24.9			34.5	
Approach LOS		D			C			C			C	

Intersection Summary

HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1156: Ashland Ave. □ W 65th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕		↗	↕			↕	↗	
Volume (vph)	0	0	0	35	7	49	14	1032	0	0	468	33	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	16	16	16	10	11	11	11	11	11	
Total Lost time (s)					5.0		4.0	4.0			4.0		
Lane Util. Factor					1.00		1.00	0.95			0.95		
Frbp, ped/bikes					0.98		1.00	1.00			0.99		
Flpb, ped/bikes					0.97		0.96	1.00			1.00		
Frt					0.93		1.00	1.00			0.99		
Flt Protected					0.98		0.95	1.00			1.00		
Satd. Flow (prot)					1720		1529	2940			2596		
Flt Permitted					0.98		0.45	1.00			1.00		
Satd. Flow (perm)					1720		718	2940			2596		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	38	8	54	15	1134	0	0	514	36	
RTOR Reduction (vph)	0	0	0	0	49	0	0	0	0	0	3	0	
Lane Group Flow (vph)	0	0	0	0	51	0	15	1134	0	0	547	0	
Confl. Peds. (#/hr)	6		22	22		6	26		27	27		26	
Heavy Vehicles (%)	0%	0%	0%	3%	14%	2%	0%	4%	0%	0%	8%	3%	
Parking (#/hr)								10				36	
Turn Type				Perm	NA		Perm	NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8			2						
Actuated Green, G (s)					8.6		72.4	72.4			72.4		
Effective Green, g (s)					8.6		72.4	72.4			72.4		
Actuated g/C Ratio					0.10		0.80	0.80			0.80		
Clearance Time (s)					5.0		4.0	4.0			4.0		
Vehicle Extension (s)					5.0		3.0	3.0			3.0		
Lane Grp Cap (vph)					164		577	2365			2088		
v/s Ratio Prot								c0.39			0.21		
v/s Ratio Perm					0.03		0.02						
v/c Ratio					0.31		0.03	0.48			0.26		
Uniform Delay, d1					37.9		1.8	2.8			2.2		
Progression Factor					1.00		0.15	0.16			0.27		
Incremental Delay, d2					2.3		0.1	0.4			0.3		
Delay (s)					40.2		0.3	0.9			0.9		
Level of Service					D		A	A			A		
Approach Delay (s)		0.0			40.2			0.9			0.9		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			3.1		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.46										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			46.7%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1158: Ashland Ave. □ W Marquette Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Volume (vph)	94	316	35	66	235	63	46	897	39	49	433	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	9	10	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.93	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1534	1680	1395	1491	1631	1369	1582	2827	949	1450	2595	823
Flt Permitted	0.50	1.00	1.00	0.39	1.00	1.00	0.44	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	812	1680	1395	607	1631	1369	739	2827	949	223	2595	823
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	103	347	38	73	258	69	51	986	43	54	476	52
RTOR Reduction (vph)	0	0	25	0	0	46	0	0	26	0	0	31
Lane Group Flow (vph)	103	347	13	73	258	23	51	986	17	54	476	21
Confl. Peds. (#/hr)	11		12	12		11	18		20	20		18
Heavy Vehicles (%)	0%	0%	0%	3%	3%	2%	0%	0%	0%	10%	7%	11%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								38	38		44	44
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	34.6	30.6	30.6	34.6	30.6	30.6	38.4	35.4	35.4	40.4	36.4	36.4
Effective Green, g (s)	34.6	30.6	30.6	34.6	30.6	30.6	38.4	35.4	35.4	40.4	36.4	36.4
Actuated g/C Ratio	0.38	0.34	0.34	0.38	0.34	0.34	0.43	0.39	0.39	0.45	0.40	0.40
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	344	571	474	272	554	465	343	1111	373	154	1049	332
v/s Ratio Prot	c0.01	c0.21		0.01	0.16		0.00	c0.35		c0.02	0.18	
v/s Ratio Perm	0.10		0.01	0.09		0.02	0.06		0.02	0.14		0.03
v/c Ratio	0.30	0.61	0.03	0.27	0.47	0.05	0.15	0.89	0.05	0.35	0.45	0.06
Uniform Delay, d1	18.4	24.7	19.8	18.4	23.3	19.9	15.3	25.4	16.9	16.3	19.5	16.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.78	0.58	1.00	0.71	0.48	0.88
Incremental Delay, d2	0.5	4.8	0.1	0.5	2.8	0.2	0.1	8.1	0.2	1.4	1.4	0.4
Delay (s)	18.9	29.5	19.9	19.0	26.1	20.1	12.1	22.7	17.0	12.9	10.9	14.8
Level of Service	B	C	B	B	C	C	B	C	B	B	B	B
Approach Delay (s)		26.5			23.8			22.0			11.4	
Approach LOS		C			C			C			B	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1160: Ashland Ave. □ W 69th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕	↕	↕↕		↕	↕↕	
Volume (vph)	75	328	49	45	178	30	34	847	66	49	463	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	10	11	11	10	11	11
Total Lost time (s)		5.0			5.0	5.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			1.00	0.94	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		0.99			1.00	1.00	0.97	1.00		0.99	1.00	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3051			1587	1344	1457	2626		1518	2441	
Flt Permitted		0.84			0.84	1.00	0.39	1.00		0.20	1.00	
Satd. Flow (perm)		2583			1342	1344	591	2626		314	2441	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	82	360	54	49	196	33	37	931	73	54	509	73
RTOR Reduction (vph)	0	10	0	0	0	20	0	6	0	0	13	0
Lane Group Flow (vph)	0	486	0	0	245	13	37	998	0	54	569	0
Confl. Peds. (#/hr)	47		48	48		47	32		48	48		32
Heavy Vehicles (%)	0%	6%	0%	0%	10%	3%	6%	4%	3%	4%	6%	8%
Parking (#/hr)								44				56
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		35.0			35.0	35.0	46.0	46.0		46.0	46.0	
Effective Green, g (s)		35.0			35.0	35.0	46.0	46.0		46.0	46.0	
Actuated g/C Ratio		0.39			0.39	0.39	0.51	0.51		0.51	0.51	
Clearance Time (s)		5.0			5.0	5.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		1004			521	522	302	1342		160	1247	
v/s Ratio Prot								c0.38				0.23
v/s Ratio Perm		c0.19			0.18	0.01	0.06			0.17		
v/c Ratio		0.48			0.47	0.02	0.12	0.74		0.34	0.46	
Uniform Delay, d1		20.7			20.6	17.0	11.5	17.3		13.0	14.0	
Progression Factor		1.00			1.00	1.00	0.17	0.17		1.95	2.05	
Incremental Delay, d2		1.7			3.0	0.1	0.6	2.7		5.4	1.1	
Delay (s)		22.4			23.6	17.1	2.5	5.6		30.7	29.9	
Level of Service		C			C	B	A	A		C	C	
Approach Delay (s)		22.4			22.8			5.5			30.0	
Approach LOS		C			C			A			C	

Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1162: Ashland Ave. □ W 71st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	68	284	32	41	277	65	77	915	24	68	402	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1572	1647	1344	1513	1615	1349	1472	2940	1001	1491	3020	1201
Flt Permitted	0.42	1.00	1.00	0.44	1.00	1.00	0.45	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	688	1647	1344	706	1615	1349	692	2940	1001	238	3020	1201
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	75	312	35	45	304	71	85	1005	26	75	442	34
RTOR Reduction (vph)	0	0	23	0	0	48	0	0	15	0	0	20
Lane Group Flow (vph)	75	312	12	45	304	23	85	1005	11	75	442	14
Confl. Peds. (#/hr)	24		18	18		24	8		7	7		8
Heavy Vehicles (%)	1%	2%	3%	5%	4%	2%	8%	4%	17%	7%	4%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								10	10		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	34.2	30.2	30.2	32.2	29.2	29.2	41.8	37.8	37.8	41.8	37.8	37.8
Effective Green, g (s)	34.2	30.2	30.2	32.2	29.2	29.2	41.8	37.8	37.8	41.8	37.8	37.8
Actuated g/C Ratio	0.38	0.34	0.34	0.36	0.32	0.32	0.46	0.42	0.42	0.46	0.42	0.42
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	552	450	279	523	437	356	1234	420	166	1268	504
v/s Ratio Prot	c0.01	c0.19		0.01	0.19		0.01	c0.34		c0.02	0.15	
v/s Ratio Perm	0.08		0.01	0.05		0.02	0.10		0.01	0.19		0.01
v/c Ratio	0.25	0.57	0.03	0.16	0.58	0.05	0.24	0.81	0.03	0.45	0.35	0.03
Uniform Delay, d1	18.6	24.5	20.0	19.4	25.3	20.9	13.8	23.0	15.3	15.7	17.7	15.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.66	0.57	1.00	1.21	1.26	1.00
Incremental Delay, d2	0.4	4.2	0.1	0.3	4.7	0.2	0.3	4.8	0.1	1.8	0.7	0.1
Delay (s)	19.0	28.7	20.1	19.7	30.0	21.1	9.4	17.8	15.4	20.7	23.0	15.4
Level of Service	B	C	C	B	C	C	A	B	B	C	C	B
Approach Delay (s)		26.2			27.4			17.1			22.2	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1168: Ashland Ave. □ W 74th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↕		↖	↕	
Volume (vph)	42	171	29	29	108	32	48	936	27	38	386	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	10	10	10	10	10	11	11	10	10	10
Total Lost time (s)		5.0	5.0		5.0	5.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.95		1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		0.99	1.00	0.97	1.00		0.99	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1560	1161		1579	1250	1411	2997		1506	2816	
Flt Permitted		0.92	1.00		0.91	1.00	0.46	1.00		0.18	1.00	
Satd. Flow (perm)		1447	1161		1447	1250	688	2997		289	2816	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	46	188	32	32	119	35	53	1029	30	42	424	30
RTOR Reduction (vph)	0	0	16	0	0	22	0	2	0	0	6	0
Lane Group Flow (vph)	0	234	16	0	151	13	53	1057	0	42	448	0
Confl. Peds. (#/hr)	7		33	33		7	20		27	27		20
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	24%	7%	17%	0%	6%	12%	10%	4%	7%	5%	6%	7%
Parking (#/hr)								0				0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		34.0	34.0		34.0	34.0	47.0	47.0		47.0	47.0	
Effective Green, g (s)		34.0	34.0		34.0	34.0	47.0	47.0		47.0	47.0	
Actuated g/C Ratio		0.38	0.38		0.38	0.38	0.52	0.52		0.52	0.52	
Clearance Time (s)		5.0	5.0		5.0	5.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		546	438		546	472	359	1565		150	1470	
v/s Ratio Prot								c0.35				0.16
v/s Ratio Perm		c0.16	0.01		0.10	0.01	0.08			0.15		
v/c Ratio		0.43	0.04		0.28	0.03	0.15	0.68		0.28	0.30	
Uniform Delay, d1		20.8	17.7		19.5	17.6	11.1	15.9		12.0	12.2	
Progression Factor		1.00	1.00		1.00	1.00	0.48	0.42		0.46	0.40	
Incremental Delay, d2		2.4	0.2		1.3	0.1	0.7	1.8		4.5	0.5	
Delay (s)		23.2	17.8		20.7	17.7	6.0	8.5		10.0	5.4	
Level of Service		C	B		C	B	A	A		A	A	
Approach Delay (s)		22.6			20.1			8.4			5.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1170: Ashland Ave. □ W 76th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↕	↕↕		↕	↕↕	
Volume (vph)	46	287	17	43	202	51	12	880	63	43	398	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3052			3016		1475	2764		1563	2629	
Flt Permitted		0.86			0.85		0.46	1.00		0.19	1.00	
Satd. Flow (perm)		2649			2576		717	2764		320	2629	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	51	315	19	47	222	56	13	967	69	47	437	23
RTOR Reduction (vph)	0	4	0	0	20	0	0	6	0	0	4	0
Lane Group Flow (vph)	0	381	0	0	305	0	13	1030	0	47	456	0
Confl. Peds. (#/hr)	1		9	9		1	2		5	5		2
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	2%	3%	6%	0%	2%	4%	8%	4%	5%	2%	7%	0%
Parking (#/hr)								28				38
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		33.0			33.0		48.0	48.0		48.0	48.0	
Effective Green, g (s)		33.0			33.0		48.0	48.0		48.0	48.0	
Actuated g/C Ratio		0.37			0.37		0.53	0.53		0.53	0.53	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		971			944		382	1474		170	1402	
v/s Ratio Prot								c0.37				0.17
v/s Ratio Perm		c0.14			0.12		0.02			0.15		
v/c Ratio		0.39			0.32		0.03	0.70		0.28	0.33	
Uniform Delay, d1		21.1			20.5		10.0	15.6		11.5	11.9	
Progression Factor		1.00			1.00		0.49	0.44		2.07	2.13	
Incremental Delay, d2		1.2			0.9		0.2	2.5		3.9	0.6	
Delay (s)		22.3			21.4		5.0	9.4		27.7	25.9	
Level of Service		C			C		A	A		C	C	
Approach Delay (s)		22.3			21.4			9.3			26.1	
Approach LOS		C			C			A			C	

Intersection Summary

HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1173: Ashland Ave. □ W 79th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	463	42	35	336	53	51	630	55	34	372	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	9	9	10	9	10	11	11	10	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.95	1.00	1.00	0.88	1.00	1.00	0.87
Flpb, ped/bikes	0.98	1.00	1.00	0.98	1.00	1.00	0.94	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1510	1527	1231	1469	1527	1201	1339	2549	786	1462	2661	789
Flt Permitted	0.37	1.00	1.00	0.21	1.00	1.00	0.49	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	593	1527	1231	325	1527	1201	695	2549	786	467	2661	789
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	104	509	46	38	369	58	56	692	60	37	409	48
RTOR Reduction (vph)	0	0	30	0	0	37	0	1	29	0	0	26
Lane Group Flow (vph)	104	509	16	38	369	21	56	697	25	37	409	22
Confl. Peds. (#/hr)	41		54	54		41	47		41	41		47
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	10%	5%	3%	10%	9%	12%	6%	4%	6%	5%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								38	38		42	42
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	32.0	32.0	32.0	32.0	32.0	32.0	42.0	42.0	42.0	42.0	42.0	42.0
Effective Green, g (s)	32.0	32.0	32.0	32.0	32.0	32.0	42.0	42.0	42.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	210	542	437	115	542	427	324	1189	366	217	1241	368
v/s Ratio Prot		c0.33			0.24			c0.27			0.15	
v/s Ratio Perm	0.18		0.01	0.12		0.02	0.08		0.03	0.08		0.03
v/c Ratio	0.50	0.94	0.04	0.33	0.68	0.05	0.17	0.59	0.07	0.17	0.33	0.06
Uniform Delay, d1	22.7	28.1	18.9	21.2	24.7	19.0	13.9	17.6	13.2	13.9	15.1	13.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.62	1.40	4.26	0.48	0.57	0.37
Incremental Delay, d2	8.1	26.2	0.2	7.5	6.8	0.2	1.0	1.9	0.3	1.6	0.7	0.3
Delay (s)	30.8	54.2	19.1	28.7	31.4	19.2	23.7	26.6	56.6	8.2	9.2	5.2
Level of Service	C	D	B	C	C	B	C	C	E	A	A	A
Approach Delay (s)		48.1			29.7			28.4			8.8	
Approach LOS		D			C			C			A	

Intersection Summary

HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1175: Ashland Ave. □ W 81st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕	↗	↖	↑↑			↑↑		
Volume (vph)	0	0	0	26	49	27	69	795	0	0	394	34	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	10	10	10	9	11	11	11	11	11	
Total Lost time (s)					5.0	5.0	4.0	4.0			4.0		
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95		
Frbp, ped/bikes					1.00	0.97	1.00	1.00			0.99		
Flpb, ped/bikes					1.00	1.00	0.93	1.00			1.00		
Frt					1.00	0.85	1.00	1.00			0.99		
Flt Protected					0.98	1.00	0.95	1.00			1.00		
Satd. Flow (prot)					1621	1338	1390	2696			2508		
Flt Permitted					0.98	1.00	0.47	1.00			1.00		
Satd. Flow (perm)					1621	1338	688	2696			2508		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	29	54	30	76	874	0	0	433	37	
RTOR Reduction (vph)	0	0	0	0	0	22	0	0	0	0	7	0	
Lane Group Flow (vph)	0	0	0	0	83	8	76	874	0	0	463	0	
Confl. Peds. (#/hr)	12		11	11		12	41		5	5		41	
Heavy Vehicles (%)	0%	0%	0%	4%	0%	4%	3%	3%	0%	0%	5%	3%	
Parking (#/hr)								44			54		
Turn Type				Perm	NA	Perm	Perm	NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8		8	2						
Actuated Green, G (s)					25.0	25.0	56.0	56.0			56.0		
Effective Green, g (s)					25.0	25.0	56.0	56.0			56.0		
Actuated g/C Ratio					0.28	0.28	0.62	0.62			0.62		
Clearance Time (s)					5.0	5.0	4.0	4.0			4.0		
Lane Grp Cap (vph)					450	371	428	1677			1560		
v/s Ratio Prot								c0.32			0.18		
v/s Ratio Perm					0.05	0.01	0.11						
v/c Ratio					0.18	0.02	0.18	0.52			0.30		
Uniform Delay, d1					24.7	23.6	7.2	9.5			7.9		
Progression Factor					1.00	1.00	0.17	0.48			0.24		
Incremental Delay, d2					0.9	0.1	0.8	1.0			0.5		
Delay (s)					25.6	23.7	2.0	5.6			2.3		
Level of Service					C	C	A	A			A		
Approach Delay (s)		0.0			25.1			5.3			2.3		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			5.9		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.42										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			49.9%		ICU Level of Service						A		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1177: Ashland Ave. □ W 83rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	256	71	48	191	39	72	744	75	49	424	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	9	11	11	9	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1515	1647	1393	1584	3061		1537	2841	1022	1535	2582	873
Flt Permitted	0.60	1.00	1.00	0.47	1.00		0.45	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	949	1647	1393	780	3061		726	2841	1022	423	2582	873
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	48	281	78	53	210	43	79	818	82	54	466	32
RTOR Reduction (vph)	0	0	38	0	19	0	0	0	31	0	0	16
Lane Group Flow (vph)	48	281	40	53	234	0	79	818	51	54	466	16
Confl. Peds. (#/hr)	3		12	12		3	7		18	18		7
Heavy Vehicles (%)	5%	2%	0%	0%	1%	3%	0%	3%	1%	0%	5%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								26	26		52	52
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	30.0	30.0	30.0	30.0	30.0		48.0	44.0	44.0	48.0	44.0	44.0
Effective Green, g (s)	30.0	30.0	30.0	30.0	30.0		48.0	44.0	44.0	48.0	44.0	44.0
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33		0.53	0.49	0.49	0.53	0.49	0.49
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	316	549	464	260	1020		423	1388	499	275	1262	426
v/s Ratio Prot		c0.17			0.08		0.01	c0.29		c0.01	0.18	
v/s Ratio Perm	0.05		0.03	0.07			0.09		0.05	0.10		0.02
v/c Ratio	0.15	0.51	0.09	0.20	0.23		0.19	0.59	0.10	0.20	0.37	0.04
Uniform Delay, d1	21.1	24.1	20.6	21.5	21.7		10.4	16.5	12.4	10.8	14.3	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.79	0.72	0.49	0.46	0.41	0.45
Incremental Delay, d2	1.0	3.4	0.4	1.8	0.5		0.2	1.6	0.4	0.3	0.8	0.2
Delay (s)	22.1	27.5	21.0	23.2	22.2		8.5	13.5	6.4	5.3	6.7	5.5
Level of Service	C	C	C	C	C		A	B	A	A	A	A
Approach Delay (s)		25.6			22.4			12.5			6.5	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1179: Ashland Ave. □ W 85th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↕	↕	
Volume (vph)	50	40	31	0	0	0	0	928	34	14	535	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	9	11	11
Total Lost time (s)		5.0						4.0		4.0	4.0	
Lane Util. Factor		1.00						0.95		1.00	0.95	
Frbp, ped/bikes		0.99						1.00		1.00	1.00	
Flpb, ped/bikes		0.99						1.00		0.99	1.00	
Frt		0.97						0.99		1.00	1.00	
Flt Protected		0.98						1.00		0.95	1.00	
Satd. Flow (prot)		1607						2645		1527	2645	
Flt Permitted		0.98						1.00		0.24	1.00	
Satd. Flow (perm)		1607						2645		393	2645	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	55	44	34	0	0	0	0	1020	37	15	588	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	117	0	0	0	0	0	1055	0	15	588	0
Confl. Peds. (#/hr)	7		8	8			7	11		13	13	11
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	6%	2%	6%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Parking (#/hr)								42			44	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		14.5						66.5		66.5	66.5	
Effective Green, g (s)		14.5						66.5		66.5	66.5	
Actuated g/C Ratio		0.16						0.74		0.74	0.74	
Clearance Time (s)		5.0						4.0		4.0	4.0	
Vehicle Extension (s)		6.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		258						1954		290	1954	
v/s Ratio Prot								c0.40			0.22	
v/s Ratio Perm		0.07								0.04		
v/c Ratio		0.45						0.54		0.05	0.30	
Uniform Delay, d1		34.2						5.1		3.2	3.9	
Progression Factor		1.00						1.00		2.59	2.64	
Incremental Delay, d2		3.5						1.1		0.3	0.4	
Delay (s)		37.7						6.2		8.6	10.8	
Level of Service		D						A		A	B	
Approach Delay (s)		37.7			0.0			6.2			10.7	
Approach LOS		D			A			A			B	

Intersection Summary

HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1181: Ashland Ave. □ W 87th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	984	115	53	710	127	228	946	53	79	386	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	10	10	11	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.95	1.00	1.00	0.88	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1504	3210	1283	1564	3179	1253	1530	2739	918	1578	2582	871
Flt Permitted	0.19	1.00	1.00	0.12	1.00	1.00	0.40	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	298	3210	1283	200	3179	1253	647	2739	918	199	2582	871
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	113	1081	126	58	780	140	251	1040	58	87	424	56
RTOR Reduction (vph)	0	0	57	0	0	60	0	0	37	0	0	37
Lane Group Flow (vph)	113	1081	69	58	780	80	251	1040	21	87	424	19
Confl. Peds. (#/hr)	34		53	53		34	16		92	92		16
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	6%	3%	3%	2%	4%	8%	4%	5%	2%	1%	5%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								32	32		52	52
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	40.1	34.5	34.5	37.1	33.0	33.0	48.4	36.8	36.8	42.0	33.4	33.4
Effective Green, g (s)	40.1	34.5	34.5	37.1	33.0	33.0	48.4	36.8	36.8	42.0	33.4	33.4
Actuated g/C Ratio	0.40	0.34	0.34	0.37	0.33	0.33	0.48	0.37	0.37	0.42	0.33	0.33
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	0.2	3.0	3.0	0.2	3.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	187	1107	442	130	1049	413	419	1007	337	202	862	290
v/s Ratio Prot	c0.03	c0.34		0.02	0.25		c0.07	c0.38		0.04	0.16	
v/s Ratio Perm	0.21		0.05	0.15		0.06	0.22		0.02	0.14		0.02
v/c Ratio	0.60	0.98	0.16	0.45	0.74	0.19	0.60	1.03	0.06	0.43	0.49	0.06
Uniform Delay, d1	21.1	32.3	22.7	23.6	29.7	24.0	16.3	31.6	20.4	20.1	26.5	22.7
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
Incremental Delay, d2	3.7	22.0	0.8	0.9	4.8	1.0	3.5	37.1	0.4	3.1	2.0	0.4
Delay (s)	24.8	54.3	23.4	24.5	34.5	25.0	19.8	68.7	20.8	23.1	28.5	23.1
Level of Service	C	D	C	C	C	C	B	E	C	C	C	C
Approach Delay (s)		48.8			32.6			57.6			27.2	
Approach LOS		D			C			E			C	

Intersection Summary		
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.97	D
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	82.0%	16.0
Analysis Period (min)	15	ICU Level of Service
		E
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

1185: Ashland Ave. □ W 91st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	16	8	24	21	2	53	7	1217	26	16	656	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	9	11	11	9	11	11
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.91		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1512			1449		1344	2582		1370	2680	
Flt Permitted		0.89			0.90		0.36	1.00		0.17	1.00	
Satd. Flow (perm)		1361			1327		515	2582		244	2680	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	18	9	26	23	2	58	8	1337	29	18	721	11
RTOR Reduction (vph)	0	22	0	0	50	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	31	0	0	33	0	8	1365	0	18	731	0
Confl. Peds. (#/hr)	16		4	4		16	4		9	9		4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	14%	4%	0%	12%	4%	0%
Parking (#/hr)								54			42	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.3			12.3		68.7	68.7		68.7	68.7	
Effective Green, g (s)		12.3			12.3		68.7	68.7		68.7	68.7	
Actuated g/C Ratio		0.14			0.14		0.76	0.76		0.76	0.76	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		8.0			8.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		186			181		393	1970		186	2045	
v/s Ratio Prot								c0.53			0.27	
v/s Ratio Perm		0.02			c0.02		0.02			0.07		
v/c Ratio		0.16			0.18		0.02	0.69		0.10	0.36	
Uniform Delay, d1		34.3			34.4		2.6	5.4		2.7	3.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.8			2.1		0.1	2.0		1.0	0.5	
Delay (s)		36.1			36.5		2.7	7.4		3.8	4.0	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		36.1			36.5			7.4			4.0	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1191: Ashland Ave. □ W 95th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	462	42	62	594	226	84	658	30	231	399	88
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	10	11	11	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	0.98		1.00	1.00	0.96	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1519	3012	1280	1511	2950		1542	3049	1241	1533	3049	1122
Flt Permitted	0.13	1.00	1.00	0.38	1.00		0.49	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	213	3012	1280	604	2950		796	3049	1241	308	3049	1122
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	192	508	46	68	653	248	92	723	33	254	438	97
RTOR Reduction (vph)	0	1	26	0	37	0	0	0	23	0	0	54
Lane Group Flow (vph)	192	512	15	68	864	0	92	723	10	254	438	43
Confl. Peds. (#/hr)	43		37	37		43	60		26	26		60
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	0%	5%	5%	8%	2%	3%	0%	4%	3%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	45.4	37.4	37.4	41.8	35.6		40.9	32.4	32.4	48.4	36.9	36.9
Effective Green, g (s)	45.4	37.4	37.4	41.8	35.6		40.9	32.4	32.4	48.4	36.9	36.9
Actuated g/C Ratio	0.43	0.36	0.36	0.40	0.34		0.39	0.31	0.31	0.46	0.35	0.35
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		4.0	3.0	3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	191	1072	455	294	1000		370	940	382	293	1071	394
v/s Ratio Prot	c0.08	0.17		0.01	0.29		0.02	0.24		c0.11	0.14	
v/s Ratio Perm	c0.36		0.01	0.08			0.08		0.01	c0.29		0.04
v/c Ratio	1.01	0.48	0.03	0.23	0.86		0.25	0.77	0.03	0.87	0.41	0.11
Uniform Delay, d1	24.3	26.2	22.0	20.1	32.4		20.8	32.9	25.3	20.8	25.8	23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	66.5	1.5	0.1	0.4	9.8		0.5	6.0	0.1	23.2	1.2	0.6
Delay (s)	90.8	27.8	22.1	20.5	42.3		21.3	38.9	25.4	44.0	26.9	23.5
Level of Service	F	C	C	C	D		C	D	C	D	C	C
Approach Delay (s)		43.7			40.8			36.5			32.0	
Approach LOS		D			D			D			C	

Intersection Summary

HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1001: Ashland Ave. □ W Irving Park Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	762	164	125	807	48	118	907	102	59	939	167
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	12	10	9	13	10	9
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00		1.00	1.00	0.89	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1578	3160	1285	1545	3142		1659	2745	830	1764	3002	1103
Flt Permitted	0.15	1.00	1.00	0.21	1.00		0.12	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	250	3160	1285	337	3142		211	2745	830	284	3002	1103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	802	173	132	849	51	124	955	107	62	988	176
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	217	802	173	132	900	0	124	955	107	62	988	176
Confl. Peds. (#/hr)	72		69	69		72	59		81	81		59
Confl. Bikes (#/hr)			5			7			7			6
Heavy Vehicles (%)	1%	1%	2%	3%	0%	4%	3%	0%	3%	0%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								36	36		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	37.4	31.4	31.4	36.6	31.0		38.6	33.1	33.1	35.4	31.5	31.5
Effective Green, g (s)	37.4	31.4	31.4	36.6	31.0		38.6	33.1	33.1	35.4	31.5	31.5
Actuated g/C Ratio	0.42	0.35	0.35	0.41	0.34		0.43	0.37	0.37	0.39	0.35	0.35
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2	0.2	0.2	0.2
Lane Grp Cap (vph)	192	1102	448	212	1082		178	1009	305	175	1050	386
v/s Ratio Prot	c0.08	0.25		0.04	0.29		c0.04	c0.35		0.02	0.33	
v/s Ratio Perm	c0.39		0.13	0.21			0.25		0.13	0.12		0.16
v/c Ratio	1.13	0.73	0.39	0.62	0.83		0.70	0.95	0.35	0.35	0.94	0.46
Uniform Delay, d1	22.8	25.6	22.0	18.5	27.1		18.8	27.6	20.7	18.7	28.3	22.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.66	0.79	0.71	1.00	1.00	1.00
Incremental Delay, d2	104.3	4.2	2.5	4.1	7.5		7.1	14.9	2.4	0.5	16.8	3.8
Delay (s)	127.1	29.8	24.6	22.5	34.6		19.5	36.5	17.0	19.1	45.1	26.5
Level of Service	F	C	C	C	C		B	D	B	B	D	C
Approach Delay (s)		46.7			33.0			33.0			41.1	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1003: Ashland Ave. □ W Grace St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕		↕	↕	
Volume (vph)	32	52	30	0	0	0	34	1036	53	39	1176	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	12	10	10	11	10	10
Total Lost time (s)		4.0					4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00					1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99					1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99					1.00	1.00		1.00	1.00	
Frt		0.96					1.00	0.99		1.00	1.00	
Flt Protected		0.99					0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1513					1710	2624		1605	2659	
Flt Permitted		0.99					0.15	1.00		0.19	1.00	
Satd. Flow (perm)		1513					279	2624		320	2659	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	55	32	0	0	0	36	1091	56	41	1238	36
RTOR Reduction (vph)	0	14	0	0	0	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	107	0	0	0	0	36	1143	0	41	1272	0
Confl. Peds. (#/hr)	23		20	20			23	11		22	22	11
Confl. Bikes (#/hr)			1				1			1		3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	3%	2%	3%
Parking (#/hr)								44			38	
Turn Type	Perm	NA					Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		26.0					56.0	56.0		56.0	56.0	
Effective Green, g (s)		26.0					56.0	56.0		56.0	56.0	
Actuated g/C Ratio		0.29					0.62	0.62		0.62	0.62	
Clearance Time (s)		4.0					4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		437					173	1632		199	1654	
v/s Ratio Prot								0.44			c0.48	
v/s Ratio Perm		0.07					0.13			0.13		
v/c Ratio		0.24					0.21	0.70		0.21	0.77	
Uniform Delay, d1		24.5					7.4	11.4		7.4	12.3	
Progression Factor		1.00					2.14	2.09		0.29	0.52	
Incremental Delay, d2		1.3					2.2	2.0		1.4	2.1	
Delay (s)		25.8					18.0	25.8		3.5	8.4	
Level of Service		C					B	C		A	A	
Approach Delay (s)		25.8			0.0			25.6			8.3	
Approach LOS		C			A			C			A	

Intersection Summary

HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1005: Ashland Ave. □ W Addison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑	↗	↖	↑↑	↗
Volume (vph)	111	531	69	130	450	75	45	803	80	74	976	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	10	10	9	10	12	10	10	12	10	10
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	0.92
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1521	1573	1385	1555	1588	1367	1632	2671	961	1692	2696	977
Flt Permitted	0.36	1.00	1.00	0.29	1.00	1.00	0.14	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	583	1573	1385	478	1588	1367	237	2671	961	380	2696	977
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	117	559	73	137	474	79	47	845	84	78	1027	79
RTOR Reduction (vph)	0	0	16	0	0	22	0	0	22	0	0	18
Lane Group Flow (vph)	117	559	57	137	474	57	47	845	62	78	1027	61
Confl. Peds. (#/hr)	30		19	19		30	25		2	2		25
Confl. Bikes (#/hr)			2			7						
Heavy Vehicles (%)	0%	3%	0%	2%	2%	0%	4%	1%	0%	1%	3%	0%
Parking (#/hr)								42	42		32	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	44.0	44.0	44.0	44.0	44.0	44.0	37.0	37.0	37.0	37.0	37.0	37.0
Effective Green, g (s)	44.0	44.0	44.0	44.0	44.0	44.0	37.0	37.0	37.0	37.0	37.0	37.0
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.41	0.41	0.41	0.41	0.41	0.41
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	285	769	677	233	776	668	97	1098	395	156	1108	401
v/s Ratio Prot		c0.36			0.30			0.32			c0.38	
v/s Ratio Perm	0.20		0.04	0.29		0.04	0.20		0.06	0.21		0.06
v/c Ratio	0.41	0.73	0.08	0.59	0.61	0.08	0.48	0.77	0.16	0.50	0.93	0.15
Uniform Delay, d1	14.7	18.2	12.3	16.5	16.8	12.3	19.5	22.8	16.7	19.6	25.2	16.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.93	0.77	1.10
Incremental Delay, d2	4.3	5.9	0.2	10.4	3.6	0.2	16.3	5.2	0.8	7.1	10.1	0.5
Delay (s)	19.0	24.2	12.5	26.9	20.3	12.5	35.8	28.0	17.5	25.5	29.5	18.9
Level of Service	B	C	B	C	C	B	D	C	B	C	C	B
Approach Delay (s)		22.2			20.7			27.5			28.5	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1007: Ashland Ave. □ W Roscoe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕			↕	↕
Volume (vph)	0	0	0	80	157	77	20	979	0	0	1145	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	10	10	10	10	10
Total Lost time (s)					4.0		4.0	4.0			4.0	4.0
Lane Util. Factor					1.00		1.00	0.95			0.95	1.00
Frbp, ped/bikes					0.99		1.00	1.00			1.00	0.84
Flpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Frt					0.97		1.00	1.00			1.00	0.85
Flt Protected					0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)					1620		1653	2955			2597	768
Flt Permitted					0.99		0.17	1.00			1.00	1.00
Satd. Flow (perm)					1620		304	2955			2597	768
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	84	165	81	21	1031	0	0	1205	62
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	0	14
Lane Group Flow (vph)	0	0	0	0	316	0	21	1031	0	0	1205	48
Confl. Peds. (#/hr)	26		25	25		26	39		18	18		39
Confl. Bikes (#/hr)			1			1			6			5
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	1%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								6			48	48
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					24.0		53.0	53.0			53.0	53.0
Effective Green, g (s)					24.0		53.0	53.0			53.0	53.0
Actuated g/C Ratio					0.28		0.62	0.62			0.62	0.62
Clearance Time (s)					4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)					457		189	1842			1619	478
v/s Ratio Prot								0.35			c0.46	
v/s Ratio Perm					0.20		0.07					0.06
v/c Ratio					0.69		0.11	0.56			0.74	0.10
Uniform Delay, d1					27.2		6.5	9.3			11.2	6.4
Progression Factor					1.00		1.98	2.26			1.00	1.00
Incremental Delay, d2					8.4		0.9	0.9			3.1	0.4
Delay (s)					35.6		13.7	21.8			14.4	6.8
Level of Service					D		B	C			B	A
Approach Delay (s)		0.0			35.6			21.7			14.0	
Approach LOS		A			D			C			B	

Intersection Summary

HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1009: Ashland Ave. □ W School St.

8/8/2013



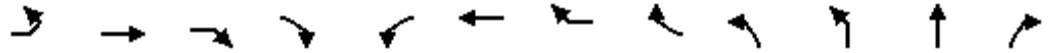
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	↗
Volume (vph)	106	173	33	10	21	23	41	1046	43	58	953	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	10	9
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.97		1.00	1.00		1.00	1.00	0.50
Flpb, ped/bikes		0.98			0.99		0.93	1.00		1.00	1.00	1.00
Frt		0.99			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1577			1518		1543	2900		1653	2973	585
Flt Permitted		0.87			0.93		0.22	1.00		0.18	1.00	1.00
Satd. Flow (perm)		1399			1427		361	2900		307	2973	585
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	182	35	11	22	24	43	1101	45	61	1003	61
RTOR Reduction (vph)	0	5	0	0	16	0	0	3	0	0	0	25
Lane Group Flow (vph)	0	324	0	0	41	0	43	1143	0	61	1003	36
Confl. Peds. (#/hr)	42		71	71		42	139		29	29		139
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	0%	3%	0%	0%	0%	0%	1%	0%	0%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								22			0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)		28.0			28.0		49.0	49.0		49.0	49.0	49.0
Effective Green, g (s)		28.0			28.0		49.0	49.0		49.0	49.0	49.0
Actuated g/C Ratio		0.33			0.33		0.58	0.58		0.58	0.58	0.58
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)		460			470		208	1671		176	1713	337
v/s Ratio Prot								c0.39			0.34	
v/s Ratio Perm		c0.23			0.03		0.12			0.20		0.06
v/c Ratio		0.70			0.09		0.21	0.68		0.35	0.59	0.11
Uniform Delay, d1		24.9			19.7		8.7	12.6		9.5	11.5	8.1
Progression Factor		1.00			1.00		1.00	1.00		1.27	1.36	1.80
Incremental Delay, d2		8.7			0.4		2.2	2.3		3.5	1.0	0.4
Delay (s)		33.6			20.0		10.9	14.9		15.6	16.6	15.0
Level of Service		C			C		B	B		B	B	B
Approach Delay (s)		33.6			20.0			14.7			16.5	
Approach LOS		C			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.69	B
Actuated Cycle Length (s)	85.0	Sum of lost time (s)
Intersection Capacity Utilization	70.6%	8.0
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	EBL2	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR
Lane Configurations		↑				↑	↓			↓	↑↑	↑
Volume (vph)	1	333	48	32	4	322	139	69	16	65	937	91
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	12	11	10	12	11	11	10	10
Total Lost time (s)		5.0				5.0	5.0			6.0	6.0	6.0
Lane Util. Factor		1.00				1.00	1.00			1.00	0.95	1.00
Frbp, ped/bikes		0.98				1.00	0.83			1.00	1.00	0.75
Flpb, ped/bikes		1.00				1.00	1.00			0.98	1.00	1.00
Frt		0.97				1.00	0.85			1.00	1.00	0.85
Flt Protected		1.00				1.00	1.00			0.95	1.00	1.00
Satd. Flow (prot)		1613				1722	1097			1619	2785	807
Flt Permitted		1.00				1.00	1.00			0.13	1.00	1.00
Satd. Flow (perm)		1612				1716	1097			220	2785	807
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	351	51	34	4	339	146	73	17	68	986	96
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	437	0	0	0	343	219	0	0	85	986	96
Confl. Peds. (#/hr)			44		44		76			63		95
Confl. Bikes (#/hr)			5				13					11
Heavy Vehicles (%)	0%	3%	4%	0%	0%	1%	11%	1%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)											24	24
Turn Type	Perm	NA			Perm	NA	Perm		Perm	Perm	NA	Perm
Protected Phases		10				14					2	
Permitted Phases	10				14		14		2	2		2
Actuated Green, G (s)		27.0				27.0	27.0			31.0	31.0	31.0
Effective Green, g (s)		27.0				27.0	27.0			31.0	31.0	31.0
Actuated g/C Ratio		0.27				0.27	0.27			0.31	0.31	0.31
Clearance Time (s)		5.0				5.0	5.0			6.0	6.0	6.0
Lane Grp Cap (vph)		435				463	296			68	863	250
v/s Ratio Prot											0.35	
v/s Ratio Perm		c0.27				0.20	0.20			0.39		0.12
v/c Ratio		1.00				0.74	0.74			1.25	1.14	0.38
Uniform Delay, d1		36.5				33.3	33.3			34.5	34.5	27.0
Progression Factor		1.00				1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2		44.3				10.2	15.3			190.6	77.9	4.4
Delay (s)		80.8				43.5	48.6			225.1	112.4	31.4
Level of Service		F				D	D			F	F	C
Approach Delay (s)		80.8				45.5					114.0	
Approach LOS		F				D					F	

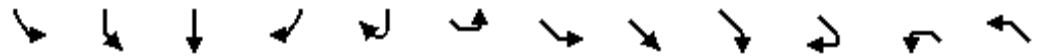
Intersection Summary

HCM 2000 Control Delay	84.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	107.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	SBL2	SBL	SBT	SBR	SBR2	SEL2	SEL	SET	SER	SER2	NWL2	NWL
Lane Configurations		↔	↕				↔	↕				↔
Volume (vph)	25	67	856	36	8	4	49	251	86	11	7	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	9	9	11	11	11	12	9
Total Lost time (s)		6.0	6.0				6.0	6.0				6.0
Lane Util. Factor		1.00	0.95				1.00	1.00				1.00
Frbp, ped/bikes		1.00	0.99				1.00	1.00				1.00
Flpb, ped/bikes		1.00	1.00				1.00	1.00				1.00
Frt		1.00	0.99				1.00	0.96				1.00
Flt Protected		0.95	1.00				0.95	1.00				0.95
Satd. Flow (prot)		1692	2978				1511	1639				1539
Flt Permitted		0.13	1.00				0.20	1.00				0.26
Satd. Flow (perm)		230	2978				310	1639				415
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	71	901	38	8	4	52	264	91	12	7	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	97	947	0	0	0	56	367	0	0	0	40
Confl. Peds. (#/hr)		95		63								
Confl. Bikes (#/hr)				6								
Heavy Vehicles (%)	4%	0%	4%	0%	0%	0%	2%	2%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			0									
Turn Type	Perm	Perm	NA			Perm	Perm	NA			Perm	Perm
Protected Phases			6					4				
Permitted Phases	6	6				4	4				8	8
Actuated Green, G (s)		31.0	31.0				25.0	25.0				25.0
Effective Green, g (s)		31.0	31.0				25.0	25.0				25.0
Actuated g/C Ratio		0.31	0.31				0.25	0.25				0.25
Clearance Time (s)		6.0	6.0				6.0	6.0				6.0
Lane Grp Cap (vph)		71	923				77	409				103
v/s Ratio Prot			0.32					0.22				
v/s Ratio Perm		0.42					0.18					0.10
v/c Ratio		1.37	1.03				0.73	0.90				0.39
Uniform Delay, d1		34.5	34.5				34.4	36.3				31.1
Progression Factor		1.00	1.00				1.00	1.00				1.00
Incremental Delay, d2		232.0	36.4				45.5	25.0				10.7
Delay (s)		266.5	70.9				79.9	61.2				41.8
Level of Service		F	E				E	E				D
Approach Delay (s)			89.1					63.7				
Approach LOS			F					E				

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	NWT	NWR	NWR2
Lane Configurations	↑		
Volume (vph)	279	97	8
Ideal Flow (vphpl)	1800	1800	1800
Lane Width	11	11	11
Total Lost time (s)	6.0		
Lane Util. Factor	1.00		
Frbp, ped/bikes	1.00		
Flpb, ped/bikes	1.00		
Frt	0.96		
Flt Protected	1.00		
Satd. Flow (prot)	1661		
Flt Permitted	1.00		
Satd. Flow (perm)	1661		
Peak-hour factor, PHF	0.95	0.95	0.95
Adj. Flow (vph)	294	102	8
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	404	0	0
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Heavy Vehicles (%)	0%	0%	25%
Bus Blockages (#/hr)	0	0	0
Parking (#/hr)			
Turn Type	NA		
Protected Phases	8		
Permitted Phases			
Actuated Green, G (s)	25.0		
Effective Green, g (s)	25.0		
Actuated g/C Ratio	0.25		
Clearance Time (s)	6.0		
Lane Grp Cap (vph)	415		
v/s Ratio Prot	c0.24		
v/s Ratio Perm			
v/c Ratio	0.97		
Uniform Delay, d1	37.2		
Progression Factor	1.00		
Incremental Delay, d2	38.0		
Delay (s)	75.2		
Level of Service	E		
Approach Delay (s)	72.2		
Approach LOS	E		

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1012: Ashland Ave. □ W Barry Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↗	↕			↕	↗
Volume (vph)	0	0	0	127	228	30	46	1125	0	0	989	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	16	16	16	11	11	10	11	11	10
Total Lost time (s)					4.0		4.0	4.0			4.0	4.0
Lane Util. Factor					1.00		1.00	0.95			0.95	1.00
Frbp, ped/bikes					1.00		1.00	1.00			1.00	0.78
Flpb, ped/bikes					0.98		0.97	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					0.98		0.95	1.00			1.00	1.00
Satd. Flow (prot)					1925		1609	2979			2808	813
Flt Permitted					0.98		0.22	1.00			1.00	1.00
Satd. Flow (perm)					1925		373	2979			2808	813
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	134	240	32	48	1184	0	0	1041	37
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	0	13
Lane Group Flow (vph)	0	0	0	0	402	0	48	1184	0	0	1041	24
Confl. Peds. (#/hr)	26		40	40		26	56		33	33		56
Confl. Bikes (#/hr)			2			2			2			3
Heavy Vehicles (%)	0%	0%	0%	3%	0%	3%	0%	1%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								16			30	30
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					25.0		52.0	52.0			52.0	52.0
Effective Green, g (s)					25.0		52.0	52.0			52.0	52.0
Actuated g/C Ratio					0.29		0.61	0.61			0.61	0.61
Clearance Time (s)					4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)					566		228	1822			1717	497
v/s Ratio Prot								c0.40			0.37	
v/s Ratio Perm					0.21		0.13					0.03
v/c Ratio					0.71		0.21	0.65			0.61	0.05
Uniform Delay, d1					26.8		7.4	10.6			10.2	6.6
Progression Factor					1.00		1.44	1.67			1.00	1.00
Incremental Delay, d2					7.4		1.6	1.4			1.6	0.2
Delay (s)					34.2		12.2	19.1			11.8	6.8
Level of Service					C		B	B			B	A
Approach Delay (s)		0.0			34.2			18.8			11.6	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1014: Ashland Ave. □ W Wellington Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕↕	↕	↕	↕↕	
Volume (vph)	120	203	99	0	0	0	173	1090	120	15	952	101
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	10	9	11	10	9
Total Lost time (s)		4.0					3.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00					1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		0.99					1.00	1.00	0.94	1.00	0.99	
Flpb, ped/bikes		0.99					1.00	1.00	1.00	0.99	1.00	
Frt		0.97					1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.99					0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1689					1621	2848	1009	1641	2784	
Flt Permitted		0.99					0.15	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1689					248	2848	1009	401	2784	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	214	104	0	0	0	182	1147	126	16	1002	106
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	33	0	10	0
Lane Group Flow (vph)	0	431	0	0	0	0	182	1147	93	16	1098	0
Confl. Peds. (#/hr)	27		8	8		27	22		11	11		22
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	2%	2%	2%	0%	0%	43%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								16	16		8	
Turn Type	Perm	NA					pm+pt	NA	Perm	Perm	NA	
Protected Phases		4					5	2			6	
Permitted Phases	4						2		2	6		
Actuated Green, G (s)		25.0					52.0	52.0	52.0	42.0	42.0	
Effective Green, g (s)		25.0					52.0	52.0	52.0	42.0	42.0	
Actuated g/C Ratio		0.29					0.61	0.61	0.61	0.49	0.49	
Clearance Time (s)		4.0					3.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		496					264	1742	617	198	1375	
v/s Ratio Prot							0.06	c0.40			c0.39	
v/s Ratio Perm		0.26					0.36		0.09	0.04		
v/c Ratio		0.87					0.69	0.66	0.15	0.08	0.80	
Uniform Delay, d1		28.5					11.1	10.7	7.1	11.3	18.0	
Progression Factor		1.00					1.57	0.26	0.01	1.70	1.72	
Incremental Delay, d2		18.4					1.3	0.2	0.0	0.6	4.0	
Delay (s)		46.9					18.8	3.0	0.1	19.9	34.8	
Level of Service		D					B	A	A	B	C	
Approach Delay (s)		46.9			0.0			4.7			34.6	
Approach LOS		D			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			22.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			85.0				Sum of lost time (s)			11.0		
Intersection Capacity Utilization			83.0%				ICU Level of Service			E		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 1018: Ashland Ave. □ W Diversey Pkwy.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	472	55	166	562	82	15	1396	114	65	1365	126
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	10	10	9	11	11	9	11	11	11
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.93	1.00	0.99	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.99
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1647	1303	1562	1647	1296	1653	2357	543	1653	2845	2845
Flt Permitted	0.14	1.00	1.00	0.19	1.00	1.00	0.10	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	229	1647	1303	318	1647	1296	178	2357	543	178	2845	2845
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	178	497	58	175	592	86	16	1469	120	68	1437	133
RTOR Reduction (vph)	0	0	34	0	0	34	0	0	28	0	8	0
Lane Group Flow (vph)	178	497	24	175	592	52	16	1469	92	68	1562	0
Confl. Peds. (#/hr)	29		30	30		29	52		17	17		52
Confl. Bikes (#/hr)			12			7			9			8
Heavy Vehicles (%)	1%	2%	0%	2%	2%	1%	0%	1%	0%	0%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								92	92			16
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	Perm	NA
Protected Phases	7	4		3	8			2				6
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	35.0	29.0	29.0	35.0	29.0	29.0	39.0	39.0	39.0	39.0	39.0	39.0
Effective Green, g (s)	35.0	29.0	29.0	35.0	29.0	29.0	39.0	39.0	39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.41	0.34	0.34	0.41	0.34	0.34	0.46	0.46	0.46	0.46	0.46	0.46
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	189	561	444	218	561	442	81	1081	249	81	1305	1305
v/s Ratio Prot	c0.07	0.30		0.06	c0.36			c0.62				0.55
v/s Ratio Perm	0.32		0.02	0.27		0.04	0.09		0.17	0.38		
v/c Ratio	0.94	0.89	0.05	0.80	1.06	0.12	0.20	1.36	0.37	0.84	1.20	1.20
Uniform Delay, d1	21.3	26.4	18.8	19.5	28.0	19.2	13.7	23.0	15.0	20.2	23.0	23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.77	0.97	0.84	0.83	0.87	0.87
Incremental Delay, d2	51.8	18.4	0.2	26.0	53.4	0.5	3.4	165.4	2.7	56.4	95.3	95.3
Delay (s)	73.0	44.8	19.0	45.5	81.4	19.8	14.0	187.9	15.3	73.1	115.4	115.4
Level of Service	E	D	B	D	F	B	B	F	B	E	F	F
Approach Delay (s)		49.6			67.8			173.2			113.6	113.6
Approach LOS		D			E			F			F	F

Intersection Summary

HCM 2000 Control Delay	115.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	102.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1019: Ashland Ave. □ W Wrightwood Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Volume (vph)	54	190	49	97	180	31	53	1279	80	32	1009	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	10	10	11	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		1.00			1.00		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes		1.00			1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt		0.98			0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1550			1566		1639	2702	925	1653	2916	1131
Flt Permitted		0.88			0.73		0.21	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)		1373			1165		356	2702	925	221	2916	1131
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	200	52	102	189	33	56	1346	84	34	1062	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	309	0	0	324	0	56	1346	84	34	1062	53
Confl. Peds. (#/hr)	9		11	11		9	20		8	8		20
Confl. Bikes (#/hr)			3						1			2
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	0%	1%	1%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								38	38		0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		27.0			27.0		50.0	50.0	50.0	50.0	50.0	50.0
Effective Green, g (s)		27.0			27.0		50.0	50.0	50.0	50.0	50.0	50.0
Actuated g/C Ratio		0.32			0.32		0.59	0.59	0.59	0.59	0.59	0.59
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		436			370		209	1589	544	130	1715	665
v/s Ratio Prot								c0.50			0.36	
v/s Ratio Perm		0.23			c0.28		0.16		0.09	0.15		0.05
v/c Ratio		0.71			0.88		0.27	0.85	0.15	0.26	0.62	0.08
Uniform Delay, d1		25.5			27.4		8.6	14.4	7.9	8.5	11.3	7.6
Progression Factor		1.00			1.00		1.00	1.00	1.00	0.17	0.15	0.20
Incremental Delay, d2		9.4			24.0		3.1	5.8	0.6	0.4	0.2	0.0
Delay (s)		34.9			51.4		11.7	20.2	8.5	1.9	1.9	1.5
Level of Service		C			D		B	C	A	A	A	A
Approach Delay (s)		34.9			51.4			19.2			1.9	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1023: Ashland Ave. □ W Fullerton Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖	↖		↖↗	↖	↖	↖↗	↖
Volume (vph)	148	619	16	97	519	28	0	1197	89	38	1020	171
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	9	10	9	10	10	10	10	10	10
Total Lost time (s)	3.0	5.0		3.0	5.0	5.0		5.0	5.0	2.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.96		1.00	0.93	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	3146		1521	1631	1270		2971	1115	1596	2944	1125
Flt Permitted	0.11	1.00		0.25	1.00	1.00		1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	180	3146		397	1631	1270		2971	1115	126	2944	1125
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	156	652	17	102	546	29	0	1260	94	40	1074	180
RTOR Reduction (vph)	0	1	0	0	0	19	0	0	43	0	0	43
Lane Group Flow (vph)	156	668	0	102	546	10	0	1260	51	40	1074	137
Confl. Peds. (#/hr)	21		21	21		21	20		34	34		20
Confl. Bikes (#/hr)			9			2			6			
Heavy Vehicles (%)	1%	1%	0%	1%	3%	4%	0%	1%	1%	0%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								4	4		0	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm		NA	custom	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2 10		1	6	
Permitted Phases	4			8		8			2	6		6
Actuated Green, G (s)	49.0	43.0		49.0	43.0	43.0		60.5	55.6	61.1	55.6	55.6
Effective Green, g (s)	49.0	43.0		49.0	43.0	43.0		58.5	55.6	61.1	55.6	55.6
Actuated g/C Ratio	0.38	0.33		0.38	0.33	0.33		0.45	0.43	0.47	0.43	0.43
Clearance Time (s)	3.0	5.0		3.0	5.0	5.0			5.0	2.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0			3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	132	1040		201	539	420		1336	476	121	1259	481
v/s Ratio Prot	c0.05	0.21		0.02	0.33			c0.42		c0.01	0.36	
v/s Ratio Perm	c0.39			0.17		0.01			0.05	0.14		0.12
v/c Ratio	1.18	0.64		0.51	1.01	0.02		0.94	0.11	0.33	0.85	0.28
Uniform Delay, d1	37.3	37.0		28.2	43.5	29.3		34.2	22.3	24.5	33.5	24.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.95	1.70	1.00	1.00	1.00
Incremental Delay, d2	135.4	3.0		2.0	42.0	0.1		1.9	0.0	1.6	7.5	1.5
Delay (s)	172.7	40.0		30.3	85.5	29.4		34.2	37.9	26.1	41.0	25.7
Level of Service	F	D		C	F	C		C	D	C	D	C
Approach Delay (s)		65.1			74.8			34.4			38.4	
Approach LOS		E			E			C			D	

Intersection Summary

HCM 2000 Control Delay	48.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1024: Medill Ave. □ Ashland Ave. □ N Clybourn Ave.

8/8/2013



Movement	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2	NEL
Lane Configurations	↑	↘		↕		↙	↕		↙	↕		↘
Volume (vph)	428	209	29	532	154	125	1283	56	132	1110	11	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	10	10	10	16
Total Lost time (s)	5.0	5.0		5.0		3.0	5.0		3.0	5.0		
Lane Util. Factor	1.00	1.00		0.95		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	0.96		1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.85		0.97		1.00	0.99		1.00	1.00		
Flt Protected	1.00	1.00		1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1740	1414		3141		1653	3089		1596	2864		
Flt Permitted	1.00	1.00		0.91		0.08	1.00		0.08	1.00		
Satd. Flow (perm)	1740	1414		2861		142	3089		137	2864		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92
Adj. Flow (vph)	451	220	31	560	162	132	1351	59	139	1168	12	0
RTOR Reduction (vph)	0	0	0	16	0	0	2	0	0	52	0	0
Lane Group Flow (vph)	451	220	0	737	0	132	1408	0	139	1128	0	0
Confl. Peds. (#/hr)		34			11	18						
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%	1%	2%	0%	4%	9%	2%
Parking (#/hr)							0			6		
Turn Type	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA		
Protected Phases	4			8		5	2		1	6		10
Permitted Phases		4	8			2			6			
Actuated Green, G (s)	59.0	59.0		59.0		57.9	49.0		58.1	49.1		
Effective Green, g (s)	59.0	59.0		59.0		57.9	49.0		58.1	49.1		
Actuated g/C Ratio	0.45	0.45		0.45		0.45	0.38		0.45	0.38		
Clearance Time (s)	5.0	5.0		5.0		3.0	5.0		3.0	5.0		
Vehicle Extension (s)	3.0	3.0		3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	789	641		1298		166	1164		162	1081		
v/s Ratio Prot	c0.26					0.05	c0.46		c0.06	0.39		
v/s Ratio Perm		0.16		0.26		0.30			0.32			
v/c Ratio	0.57	0.34		0.57		0.80	1.21		0.86	1.04		
Uniform Delay, d1	26.2	23.0		26.1		28.6	40.5		30.8	40.5		
Progression Factor	1.00	1.00		1.00		1.18	0.96		1.63	0.48		
Incremental Delay, d2	3.0	1.5		1.8		15.1	99.5		24.3	34.4		
Delay (s)	29.2	24.4		27.9		49.0	138.4		74.3	53.9		
Level of Service	C	C		C		D	F		E	D		
Approach Delay (s)	27.6			27.9			130.8			56.0		0.0
Approach LOS	C			C			F			E		A

Intersection Summary

HCM 2000 Control Delay	73.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	113.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1025: Ashland Ave. □ W Webster Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↕	↗	↖	↕	↗
Volume (vph)	103	204	9	221	350	21	14	1207	176	18	1137	103
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	9	10	10
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00	0.98		1.00		1.00	1.00	0.97	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98	1.00		0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1652	1406		3096		1595	3002	1205	1385	2852	
Flt Permitted		0.61	1.00		0.66		0.12	1.00	1.00	0.12	1.00	
Satd. Flow (perm)		1019	1406		2081		204	3002	1205	177	2852	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	215	9	233	368	22	15	1271	185	19	1197	108
RTOR Reduction (vph)	0	0	6	0	4	0	0	0	77	0	10	0
Lane Group Flow (vph)	0	323	3	0	619	0	15	1271	108	19	1295	0
Confl. Peds. (#/hr)	4		4	4		4	6		6	6		6
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	1%	0%	11%	5%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								0	0		0	
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		24.0	24.0		24.0		33.0	33.0	33.0	33.0	33.0	
Effective Green, g (s)		24.0	24.0		24.0		33.0	33.0	33.0	33.0	33.0	
Actuated g/C Ratio		0.37	0.37		0.37		0.51	0.51	0.51	0.51	0.51	
Clearance Time (s)		4.0	4.0		4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		376	519		768		103	1524	611	89	1447	
v/s Ratio Prot								0.42			c0.45	
v/s Ratio Perm		c0.32	0.00		0.30		0.07		0.09	0.11		
v/c Ratio		0.86	0.01		0.81		0.15	0.83	0.18	0.21	0.89	
Uniform Delay, d1		18.9	13.0		18.4		8.5	13.7	8.7	8.8	14.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.24	1.36	
Incremental Delay, d2		21.7	0.0		8.9		3.0	5.5	0.6	2.0	3.7	
Delay (s)		40.7	13.0		27.3		11.5	19.2	9.3	13.0	23.3	
Level of Service		D	B		C		B	B	A	B	C	
Approach Delay (s)		39.9			27.3			17.9			23.1	
Approach LOS		D			C			B			C	

Intersection Summary

HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1026: Ashland Ave. □ N Elston Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	286	70	0	494	218	115	1157	0	53	1037	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	16	16	12	10	14	14	10	10	10
Total Lost time (s)	4.0	4.0	4.0		4.0	3.0	4.0	4.0		3.0	3.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.98		1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1592	1647	1335		2020	1505	1596	3431		1596	2937	
Flt Permitted	0.13	1.00	1.00		1.00	1.00	0.13	1.00		0.12	1.00	
Satd. Flow (perm)	216	1647	1335		2020	1505	212	3431		204	2937	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	301	74	0	520	229	121	1218	0	56	1092	19
RTOR Reduction (vph)	0	0	52	0	0	30	0	0	0	0	1	0
Lane Group Flow (vph)	22	301	22	0	520	199	121	1218	0	56	1110	0
Confl. Peds. (#/hr)	8		9	9		8	1		3	3		1
Heavy Vehicles (%)	0%	2%	1%	0%	1%	0%	0%	1%	0%	0%	3%	0%
Parking (#/hr)								0				0
Turn Type	Perm	NA	Perm		NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	1	5	2		1	6	
Permitted Phases	4		4			8	2			6		
Actuated Green, G (s)	31.0	31.0	31.0		31.0	39.0	55.0	55.0		41.0	41.0	
Effective Green, g (s)	31.0	31.0	31.0		31.0	39.0	55.0	55.0		41.0	41.0	
Actuated g/C Ratio	0.30	0.30	0.30		0.30	0.37	0.52	0.52		0.39	0.39	
Clearance Time (s)	4.0	4.0	4.0		4.0	3.0	4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	63	486	394		596	559	401	1797		185	1146	
v/s Ratio Prot		0.18			c0.26	0.03	0.06	c0.35		0.02	c0.38	
v/s Ratio Perm	0.10		0.02			0.11	0.09			0.09		
v/c Ratio	0.35	0.62	0.06		0.87	0.36	0.30	0.68		0.30	0.97	
Uniform Delay, d1	29.1	31.9	26.5		35.1	23.9	26.7	18.5		23.8	31.4	
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.70	0.61		1.00	1.00	
Incremental Delay, d2	14.6	5.8	0.3		16.1	1.8	1.2	1.3		4.2	20.0	
Delay (s)	43.7	37.7	26.8		51.3	25.7	19.8	12.5		28.0	51.4	
Level of Service	D	D	C		D	C	B	B		C	D	
Approach Delay (s)		36.0			43.4			13.1			50.2	
Approach LOS		D			D			B			D	

Intersection Summary

HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1027: Ashland Ave. □ W Armitage Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗			↖			↖↗↘			↖↗	↘
Volume (vph)	449	286	29	3	412	0	46	746	3	0	946	332
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	10	10	16	16	16	10	10	10	11	11	10
Total Lost time (s)	3.0	5.0			5.0			4.0			4.0	3.0
Lane Util. Factor	1.00	1.00			1.00			0.91			0.95	1.00
Frbp, ped/bikes	1.00	1.00			1.00			1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.99			1.00			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			1.00			1.00	1.00
Satd. Flow (prot)	1636	1610			1980			4245			3210	1189
Flt Permitted	0.22	1.00			1.00			0.78			1.00	1.00
Satd. Flow (perm)	374	1610			1977			3325			3210	1189
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	473	301	31	3	434	0	48	785	3	0	996	349
RTOR Reduction (vph)	0	3	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	473	329	0	0	437	0	0	835	0	0	996	349
Confl. Peds. (#/hr)	6		5	5		6	15		12	12		15
Heavy Vehicles (%)	1%	3%	0%	0%	3%	0%	0%	3%	33%	0%	3%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	0	0
Parking (#/hr)								0				0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA			NA	custom
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2					16
Actuated Green, G (s)	53.0	53.0			29.0			38.0			43.0	43.0
Effective Green, g (s)	53.0	53.0			29.0			38.0			43.0	43.0
Actuated g/C Ratio	0.50	0.50			0.28			0.36			0.41	0.41
Clearance Time (s)	3.0	5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)	441	812			546			1203			1314	486
v/s Ratio Prot	c0.21	0.20									c0.31	
v/s Ratio Perm	c0.33				0.22			0.25				0.29
v/c Ratio	1.07	0.40			0.80			0.69			0.76	0.72
Uniform Delay, d1	24.6	16.2			35.3			28.6			26.5	25.9
Progression Factor	1.00	1.00			1.00			1.20			0.76	0.74
Incremental Delay, d2	63.6	1.5			11.7			2.5			2.4	5.3
Delay (s)	88.2	17.7			47.0			36.6			22.6	24.4
Level of Service	F	B			D			D			C	C
Approach Delay (s)		59.1			47.0			36.6			23.1	
Approach LOS		E			D			D			C	

Intersection Summary

HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1029: Ashland Ave. □ W Cortland St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↔			↑↔			↑↔	
Volume (vph)	2	181	16	111	259	9	4	835	120	0	982	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frbp, ped/bikes		1.00	0.97		1.00			0.95			0.99	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		1.00			0.98			0.99	
Flt Protected		1.00	1.00		0.99			1.00			1.00	
Satd. Flow (prot)		1698	1488		1699			2400			3010	
Flt Permitted		1.00	1.00		0.82			0.95			1.00	
Satd. Flow (perm)		1694	1488		1422			2284			3010	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	191	17	117	273	9	4	879	126	0	1034	62
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	193	17	0	398	0	0	1009	0	0	1096	0
Confl. Peds. (#/hr)	62		8	8		62	24		125	125		24
Heavy Vehicles (%)	0%	6%	0%	5%	3%	0%	0%	2%	0%	0%	3%	2%
Parking (#/hr)								64			0	
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2					
Actuated Green, G (s)		43.0	43.0		43.0			53.0			53.0	
Effective Green, g (s)		43.0	43.0		43.0			53.0			53.0	
Actuated g/C Ratio		0.41	0.41		0.41			0.50			0.50	
Clearance Time (s)		5.0	5.0		5.0			4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		693	609		582			1152			1519	
v/s Ratio Prot											0.36	
v/s Ratio Perm		0.11	0.01		c0.28			c0.44				
v/c Ratio		0.28	0.03		0.68			0.88			0.72	
Uniform Delay, d1		20.7	18.5		25.4			23.1			20.3	
Progression Factor		1.00	1.00		1.00			1.00			0.18	
Incremental Delay, d2		1.0	0.1		3.3			9.4			2.4	
Delay (s)		21.7	18.6		28.8			32.5			6.0	
Level of Service		C	B		C			C			A	
Approach Delay (s)		21.4			28.8			32.5			6.0	
Approach LOS		C			C			C			A	

Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1030: Ashland Ave. □ W Wabansia Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕↕	↗	↗	↕↕	↗
Volume (vph)	33	5	74	7	5	25	59	868	6	10	977	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	9	10	10	9
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.96			0.98		1.00	1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes		1.00			1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt		0.91			0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1426			1475		1557	2743	1026	1330	2861	1052
Flt Permitted		0.89			0.95		0.26	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)		1287			1414		434	2743	1026	423	2861	1052
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	5	78	7	5	26	62	914	6	11	1028	12
RTOR Reduction (vph)	0	70	0	0	23	0	0	0	1	0	0	2
Lane Group Flow (vph)	0	48	0	0	15	0	62	914	5	11	1028	10
Confl. Peds. (#/hr)	6		15	15		6	8					8
Heavy Vehicles (%)	3%	0%	1%	0%	0%	0%	2%	3%	0%	20%	6%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								26	26		0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		9.1			9.1		67.9	67.9	67.9	67.9	67.9	67.9
Effective Green, g (s)		9.1			9.1		67.9	67.9	67.9	67.9	67.9	67.9
Actuated g/C Ratio		0.11			0.11		0.80	0.80	0.80	0.80	0.80	0.80
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		5.0			5.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		137			151		346	2191	819	337	2285	840
v/s Ratio Prot								0.33			c0.36	
v/s Ratio Perm		c0.04			0.01		0.14		0.00	0.03		0.01
v/c Ratio		0.35			0.10		0.18	0.42	0.01	0.03	0.45	0.01
Uniform Delay, d1		35.2			34.2		2.0	2.6	1.7	1.8	2.7	1.7
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.3			0.6		1.1	0.6	0.0	0.2	0.6	0.0
Delay (s)		38.5			34.8		3.1	3.2	1.7	1.9	3.3	1.8
Level of Service		D			C		A	A	A	A	A	A
Approach Delay (s)		38.5			34.8			3.2			3.3	
Approach LOS		D			C			A			A	

Intersection Summary

HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1033: Ashland Ave. □ W North Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘		↗	↗↘	↗	↗	↗↘	↗
Volume (vph)	88	453	57	131	465	33	127	993	199	121	956	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	10	10	10	10	10	10
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.95	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1466	2703		1500	2980		1596	2696	929	1492	2644	828
Flt Permitted	0.36	1.00		0.31	1.00		0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	562	2703		492	2980		225	2696	929	187	2644	828
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	93	477	60	138	489	35	134	1045	209	127	1006	21
RTOR Reduction (vph)	0	10	0	0	5	0	0	0	52	0	0	13
Lane Group Flow (vph)	93	527	0	138	519	0	134	1045	157	127	1006	8
Confl. Peds. (#/hr)			48	48			20		21	21		20
Heavy Vehicles (%)	5%	12%	4%	2%	2%	6%	0%	3%	5%	7%	2%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								32	32		42	42
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	33.2	27.6		36.0	29.0		41.4	35.4	35.4	41.4	35.4	35.4
Effective Green, g (s)	33.2	27.6		36.0	29.0		41.4	35.4	35.4	41.4	35.4	35.4
Actuated g/C Ratio	0.37	0.31		0.40	0.32		0.46	0.39	0.39	0.46	0.39	0.39
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	263	828		275	960		194	1060	365	173	1039	325
v/s Ratio Prot	0.02	c0.19		c0.04	0.17		0.05	c0.39		c0.05	0.38	
v/s Ratio Perm	0.11			0.16			0.27		0.17	0.29		0.01
v/c Ratio	0.35	0.64		0.50	0.54		0.69	0.99	0.43	0.73	0.97	0.03
Uniform Delay, d1	19.3	26.9		18.4	25.0		17.0	27.1	19.9	17.5	26.7	16.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	3.7		1.4	2.2		10.1	24.4	3.7	14.9	21.2	0.1
Delay (s)	20.2	30.6		19.8	27.2		27.2	51.5	23.6	32.4	48.0	16.9
Level of Service	C	C		B	C		C	D	C	C	D	B
Approach Delay (s)		29.0			25.7			45.0			45.7	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1039: Ashland Ave. □ W Blackhawk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	15	40	5	33	25	66	13	1102	50	50	1097	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	11	11	11	9	10	10	9	10	10
Total Lost time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		0.99	1.00		1.00	1.00	
Frt		0.99			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1922			1514		1409	2619		1507	2893	
Flt Permitted		0.94			0.93		0.15	1.00		0.14	1.00	
Satd. Flow (perm)		1834			1431		226	2619		226	2893	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	42	5	35	26	69	14	1160	53	53	1155	24
RTOR Reduction (vph)	0	3	0	0	38	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	60	0	0	92	0	14	1208	0	53	1177	0
Confl. Peds. (#/hr)	18		38	38		18	47		5	5		47
Heavy Vehicles (%)	0%	2%	20%	6%	0%	2%	8%	1%	0%	2%	1%	0%
Parking (#/hr)								46				12
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0			24.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)		24.0			24.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio		0.37			0.37		0.54	0.54		0.54	0.54	
Clearance Time (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		677			528		121	1410		121	1557	
v/s Ratio Prot								c0.46				0.41
v/s Ratio Perm		0.03			c0.06		0.06			0.23		
v/c Ratio		0.09			0.17		0.12	0.86		0.44	0.76	
Uniform Delay, d1		13.4			13.8		7.4	12.9		9.1	11.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.7		1.9	6.9		11.1	3.5	
Delay (s)		13.6			14.5		9.3	19.7		20.2	15.1	
Level of Service		B			B		A	B		C	B	
Approach Delay (s)		13.6			14.5			19.6			15.4	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.3									B
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			65.0								6.0	
Intersection Capacity Utilization			63.9%									B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1042: Ashland Ave. □ N Milwaukee Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↑	↖	↖	↑↑	↖	↖	↖↗	
Volume (vph)	26	237	73	0	340	77	79	805	3	20	1142	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	11	11	11	10	10	8	10	12	12
Total Lost time (s)	5.0	5.0			5.0	3.0	3.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99			1.00	0.95	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	0.98	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1497	1595			1706	1395	1580	3129	1155	1277	3184	
Flt Permitted	0.54	1.00			1.00	1.00	0.11	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	858	1595			1706	1395	175	3129	1155	417	3184	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	249	77	0	358	81	83	847	3	21	1202	3
RTOR Reduction (vph)	0	12	0	0	0	39	0	0	2	0	0	0
Lane Group Flow (vph)	27	314	0	0	358	42	83	847	1	21	1205	0
Confl. Peds. (#/hr)	49		18	18		49	5					5
Heavy Vehicles (%)	4%	5%	3%	0%	2%	1%	1%	2%	0%	25%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA			NA	custom	pm+pt	NA	Perm	Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4					3 8	2		2	6		
Actuated Green, G (s)	29.0	29.0			37.0	37.0	43.0	43.0	43.0	35.0	35.0	
Effective Green, g (s)	29.0	29.0			37.0	37.0	43.0	43.0	43.0	35.0	35.0	
Actuated g/C Ratio	0.32	0.32			0.41	0.41	0.48	0.48	0.48	0.39	0.39	
Clearance Time (s)	5.0	5.0			5.0		3.0	5.0	5.0	5.0	5.0	
Lane Grp Cap (vph)	276	513			701	573	161	1494	551	162	1238	
v/s Ratio Prot		c0.20			c0.21		0.03	c0.27			c0.38	
v/s Ratio Perm	0.03					0.03	0.22		0.00	0.05		
v/c Ratio	0.10	0.61			0.51	0.07	0.52	0.57	0.00	0.13	0.97	
Uniform Delay, d1	21.3	25.7			19.8	16.1	17.9	16.8	12.3	17.7	27.0	
Progression Factor	1.00	1.00			1.00	1.00	0.68	0.50	1.00	1.00	1.00	
Incremental Delay, d2	0.7	5.4			2.6	0.2	9.7	1.3	0.0	1.6	19.9	
Delay (s)	22.1	31.1			22.4	16.3	21.9	9.8	12.3	19.3	47.0	
Level of Service	C	C			C	B	C	A	B	B	D	
Approach Delay (s)		30.4			21.3			10.9			46.5	
Approach LOS		C			C			B			D	

Intersection Summary

HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1043: Ashland Ave. □ W Division St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑↗			↑↑	↗
Volume (vph)	98	408	29	231	566	15	91	920	168	5	976	145
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	10	9	11	9	11	11	9
Total Lost time (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91			0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.86	1.00	1.00	0.81	1.00	0.96			1.00	0.71
Flpb, ped/bikes	0.92	1.00	1.00	0.98	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)	1511	3179	1266	1616	3160	1164	1534	4195			3108	851
Flt Permitted	0.43	1.00	1.00	0.38	1.00	1.00	0.13	1.00			0.95	1.00
Satd. Flow (perm)	679	3179	1266	643	3160	1164	205	4195			2950	851
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	429	31	243	596	16	96	968	177	5	1027	153
RTOR Reduction (vph)	0	0	22	0	0	10	0	29	0	0	0	58
Lane Group Flow (vph)	103	429	9	243	596	6	96	1116	0	0	1032	95
Confl. Peds. (#/hr)	169		130	130		169	272		244	244		272
Confl. Bikes (#/hr)						3						5
Heavy Vehicles (%)	1%	4%	0%	0%	1%	0%	0%	1%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								10			0	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4	8		8	2		6			6
Actuated Green, G (s)	26.0	26.0	26.0	36.0	36.0	36.0	44.0	44.0			36.2	36.2
Effective Green, g (s)	26.0	26.0	26.0	36.0	36.0	36.0	44.0	44.0			36.2	36.2
Actuated g/C Ratio	0.29	0.29	0.29	0.40	0.40	0.40	0.49	0.49			0.40	0.40
Clearance Time (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	196	918	365	332	1264	465	171	2050			1186	342
v/s Ratio Prot		0.13		c0.06	0.19		0.03	c0.27				
v/s Ratio Perm	0.15		0.01	c0.24		0.01	0.24				c0.35	0.11
v/c Ratio	0.53	0.47	0.02	0.73	0.47	0.01	0.56	0.54			0.87	0.28
Uniform Delay, d1	26.8	26.3	22.9	21.3	20.0	16.3	15.7	16.0			24.7	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			0.87	1.26
Incremental Delay, d2	9.7	1.7	0.1	13.3	1.3	0.1	4.2	1.0			3.1	0.6
Delay (s)	36.6	28.0	23.0	34.7	21.2	16.3	19.9	17.1			24.5	23.4
Level of Service	D	C	C	C	C	B	B	B			C	C
Approach Delay (s)		29.3			25.0			17.3			24.4	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1049: Ashland Ave. □ W Augusta Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↕		↖	↗	
Volume (vph)	113	244	58	69	467	59	78	1047	34	30	1003	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	9	10	9	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1573	1671		1520	1663	1342	1594	2793		1580	2638	
Flt Permitted	0.25	1.00		0.44	1.00	1.00	0.14	1.00		0.16	1.00	
Satd. Flow (perm)	415	1671		705	1663	1342	237	2793		263	2638	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	257	61	73	492	62	82	1102	36	32	1056	138
RTOR Reduction (vph)	0	13	0	0	0	32	0	3	0	0	16	0
Lane Group Flow (vph)	119	305	0	73	492	30	82	1135	0	32	1178	0
Confl. Peds. (#/hr)	14		5	5		14	6		37	37		6
Heavy Vehicles (%)	1%	1%	0%	1%	1%	0%	0%	2%	3%	0%	4%	1%
Parking (#/hr)								20				30
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	25.0	25.0		25.0	25.0	25.0	34.0	34.0		34.0	34.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0	25.0	34.0	34.0		34.0	34.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38	0.38	0.52	0.52		0.52	0.52	
Clearance Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	642		271	639	516	123	1460		137	1379	
v/s Ratio Prot		0.18			c0.30			0.41				c0.45
v/s Ratio Perm	0.29			0.10		0.02	0.35			0.12		
v/c Ratio	0.75	0.48		0.27	0.77	0.06	0.67	0.78		0.23	0.85	
Uniform Delay, d1	17.3	15.1		13.7	17.5	12.6	11.4	12.5		8.4	13.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.2	2.5		2.4	8.7	0.2	25.1	4.1		4.0	6.9	
Delay (s)	44.4	17.6		16.2	26.2	12.8	36.4	16.6		12.4	20.3	
Level of Service	D	B		B	C	B	D	B		B	C	
Approach Delay (s)		24.9			23.7			17.9			20.1	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1056: Ashland Ave. □ W Chicago Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	
Volume (vph)	71	422	72	28	611	32	103	997	81	53	709	203
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	10	10	10	10	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3210		1624	3246		1595	2834		1594	2973	
Flt Permitted	0.29	1.00		0.39	1.00		0.14	1.00		0.12	1.00	
Satd. Flow (perm)	500	3210		659	3246		234	2834		203	2973	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	444	76	29	643	34	108	1049	85	56	746	214
RTOR Reduction (vph)	0	17	0	0	4	0	0	6	0	0	29	0
Lane Group Flow (vph)	75	503	0	29	673	0	108	1128	0	56	931	0
Confl. Peds. (#/hr)	16		50	50		16	38		121	121		38
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	1%	1%
Parking (#/hr)								14				0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.0	33.0		33.0	33.0		43.8	35.8		38.2	33.0	
Effective Green, g (s)	33.0	33.0		33.0	33.0		43.8	35.8		38.2	33.0	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.52	0.42		0.45	0.39	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	3.0		4.0	3.0	
Lane Grp Cap (vph)	194	1246		255	1260		248	1193		176	1154	
v/s Ratio Prot		0.16			c0.21		c0.04	c0.40		0.02	0.31	
v/s Ratio Perm	0.15			0.04			0.18			0.12		
v/c Ratio	0.39	0.40		0.11	0.53		0.44	0.95		0.32	0.81	
Uniform Delay, d1	18.7	18.9		16.6	20.1		13.4	23.7		15.4	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	1.0		0.9	1.6		1.7	15.8		1.4	6.1	
Delay (s)	24.4	19.8		17.5	21.7		15.1	39.5		16.9	29.3	
Level of Service	C	B		B	C		B	D		B	C	
Approach Delay (s)		20.4			21.5			37.4			28.6	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1062: Ashland Ave. □ W Erie St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Volume (vph)	37	20	25	13	38	23	50	1258	14	27	894	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		5.0			5.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.94	1.00	1.00	0.95
Flpb, ped/bikes		1.00			1.00		0.99	1.00	1.00	1.00	1.00	1.00
Frt		0.96			0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1533			1578		1588	2923	1104	1596	2863	1049
Flt Permitted		0.86			0.95		0.26	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)		1341			1516		432	2923	1104	250	2863	1049
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	21	26	14	40	24	53	1324	15	28	941	29
RTOR Reduction (vph)	0	17	0	0	18	0	0	0	5	0	0	8
Lane Group Flow (vph)	0	69	0	0	60	0	53	1324	10	28	941	21
Confl. Peds. (#/hr)	8		16	16		8	8		11	11		8
Heavy Vehicles (%)	0%	5%	0%	0%	0%	0%	0%	1%	0%	0%	2%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								10	10		14	14
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		23.0			23.0		59.0	59.0	59.0	59.0	59.0	59.0
Effective Green, g (s)		23.0			23.0		59.0	59.0	59.0	59.0	59.0	59.0
Actuated g/C Ratio		0.26			0.26		0.66	0.66	0.66	0.66	0.66	0.66
Clearance Time (s)		5.0			5.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		342			387		283	1916	723	163	1876	687
v/s Ratio Prot								c0.45			0.33	
v/s Ratio Perm		c0.05			0.04		0.12		0.01	0.11		0.02
v/c Ratio		0.20			0.16		0.19	0.69	0.01	0.17	0.50	0.03
Uniform Delay, d1		26.3			26.0		6.1	9.8	5.4	6.0	8.0	5.4
Progression Factor		1.00			1.00		0.57	0.47	0.14	1.00	1.00	1.00
Incremental Delay, d2		1.3			0.9		0.8	1.2	0.0	2.3	1.0	0.1
Delay (s)		27.6			26.8		4.3	5.8	0.8	8.3	8.9	5.5
Level of Service		C			C		A	A	A	A	A	A
Approach Delay (s)		27.6			26.8			5.7			8.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1066: Ashland Ave. □ W Grand Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘		↗	↗↘		↗	↗↘	↗
Volume (vph)	149	475	75	65	512	104	170	994	50	58	682	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	0.89
Flpb, ped/bikes	1.00	1.00		0.96	1.00		0.96	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1580	3001		1529	3026		1521	2865		1596	2973	1106
Flt Permitted	0.23	1.00		0.43	1.00		0.38	1.00		0.10	1.00	1.00
Satd. Flow (perm)	381	3001		699	3026		607	2865		170	2973	1106
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	500	79	68	539	109	179	1046	53	61	718	54
RTOR Reduction (vph)	0	14	0	0	19	0	0	4	0	0	0	24
Lane Group Flow (vph)	157	565	0	68	629	0	179	1095	0	61	718	30
Confl. Peds. (#/hr)	5		69	69		5	56		23	23		56
Heavy Vehicles (%)	1%	3%	1%	0%	3%	0%	1%	1%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								14			0	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases	7	4			8			2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	37.0	37.0		28.0	28.0		36.5	36.5		45.0	45.0	45.0
Effective Green, g (s)	37.0	37.0		28.0	28.0		36.5	36.5		45.0	45.0	45.0
Actuated g/C Ratio	0.41	0.41		0.31	0.31		0.41	0.41		0.50	0.50	0.50
Clearance Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	236	1233		217	941		246	1161		172	1486	553
v/s Ratio Prot	c0.04	0.19			0.21			c0.38		0.02	c0.24	
v/s Ratio Perm	c0.23			0.10			0.30			0.16		0.03
v/c Ratio	0.67	0.46		0.31	0.67		0.73	0.94		0.35	0.48	0.05
Uniform Delay, d1	18.6	19.2		23.7	27.0		22.6	25.7		15.5	14.8	11.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.62	1.04	1.45
Incremental Delay, d2	6.9	1.2		3.7	3.8		17.1	15.9		1.1	1.0	0.2
Delay (s)	25.5	20.5		27.4	30.7		39.7	41.6		26.3	16.5	17.0
Level of Service	C	C		C	C		D	D		C	B	B
Approach Delay (s)		21.5			30.4			41.3			17.2	
Approach LOS		C			C			D			B	

Intersection Summary

HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1073: Ashland Ave. □ W Fulton St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	49	55	0	1010	1032	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11
Total Lost time (s)	3.0			3.0	3.0	
Lane Util. Factor	1.00			0.95	0.95	
Frbp, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.93			1.00	1.00	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1485			3079	3011	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1485			3079	3011	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	58	0	1063	1086	20
RTOR Reduction (vph)	45	0	0	0	1	0
Lane Group Flow (vph)	65	0	0	1063	1105	0
Confl. Peds. (#/hr)	18	3				
Heavy Vehicles (%)	0%	9%	0%	2%	4%	5%
Parking (#/hr)				0	0	
Turn Type	NA		custom	NA	NA	
Protected Phases	4		5 10	2 10	6	
Permitted Phases			2			
Actuated Green, G (s)	19.0			57.0	49.0	
Effective Green, g (s)	19.0			57.0	49.0	
Actuated g/C Ratio	0.21			0.63	0.54	
Clearance Time (s)	3.0				3.0	
Lane Grp Cap (vph)	313			1950	1639	
v/s Ratio Prot	c0.04			c0.35	c0.37	
v/s Ratio Perm						
v/c Ratio	0.21			0.55	0.67	
Uniform Delay, d1	29.3			9.2	14.8	
Progression Factor	1.00			0.07	1.00	
Incremental Delay, d2	1.5			0.8	2.2	
Delay (s)	30.8			1.5	17.0	
Level of Service	C			A	B	
Approach Delay (s)	30.8			1.5	17.0	
Approach LOS	C			A	B	

Intersection Summary

HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1074: Ashland Ave. □ W Fulton St. (East)

8/8/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	26	61	1010	10	25	1032
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10
Total Lost time (s)	3.0		3.0		2.0	3.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frpb, ped/bikes	0.92		1.00		1.00	1.00
Flpb, ped/bikes	1.00		1.00		1.00	1.00
Frt	0.91		1.00		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1291		2966		1478	2854
Flt Permitted	0.99		1.00		0.18	1.00
Satd. Flow (perm)	1291		2966		281	2854
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	27	64	1063	11	26	1086
RTOR Reduction (vph)	50	0	1	0	0	0
Lane Group Flow (vph)	41	0	1073	0	26	1086
Confl. Peds. (#/hr)	3	18				
Heavy Vehicles (%)	8%	7%	2%	10%	8%	4%
Parking (#/hr)			0			8
Turn Type	NA		NA		custom	NA
Protected Phases	8		2		1 14	6 14
Permitted Phases					6	
Actuated Green, G (s)	19.0		49.0		60.0	57.0
Effective Green, g (s)	19.0		49.0		60.0	57.0
Actuated g/C Ratio	0.21		0.54		0.67	0.63
Clearance Time (s)	3.0		3.0			
Lane Grp Cap (vph)	272		1614		333	1807
v/s Ratio Prot	c0.03		c0.36		c0.01	c0.38
v/s Ratio Perm					0.04	
v/c Ratio	0.15		0.66		0.08	0.60
Uniform Delay, d1	28.9		14.6		6.6	9.8
Progression Factor	1.00		0.17		0.15	0.07
Incremental Delay, d2	1.2		1.9		0.3	1.1
Delay (s)	30.1		4.4		1.3	1.8
Level of Service	C		A		A	A
Approach Delay (s)	30.1		4.4			1.8
Approach LOS	C		A			A

Intersection Summary

HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1077: Ashland Ave. □ W Lake St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕	↗	↗	↕	↗
Volume (vph)	27	201	31	33	269	89	17	814	37	70	748	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	10	10	12
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes		0.99			0.99		1.00	1.00	0.83	1.00	1.00	0.68
Flpb, ped/bikes		1.00			1.00		0.92	1.00	1.00	0.97	1.00	1.00
Frt		0.98			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1717			1695		1472	2718	822	1542	3099	938
Flt Permitted		0.91			0.96		0.31	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)		1570			1629		488	2718	822	465	3099	938
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	28	212	33	35	283	94	18	857	39	74	787	42
RTOR Reduction (vph)	0	6	0	0	12	0	0	0	15	0	0	16
Lane Group Flow (vph)	0	267	0	0	400	0	18	857	24	74	787	26
Confl. Peds. (#/hr)	27		52	52		27	88		45	45		88
Confl. Bikes (#/hr)			2						2			
Heavy Vehicles (%)	0%	2%	0%	0%	1%	2%	0%	1%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								36	36			0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		26.0			26.0		56.0	56.0	56.0	56.0	56.0	56.0
Effective Green, g (s)		26.0			26.0		56.0	56.0	56.0	56.0	56.0	56.0
Actuated g/C Ratio		0.29			0.29		0.62	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)		453			470		303	1691	511	289	1928	583
v/s Ratio Prot								c0.32			0.25	
v/s Ratio Perm		0.17			c0.25		0.04		0.03	0.16		0.03
v/c Ratio		0.59			0.85		0.06	0.51	0.05	0.26	0.41	0.04
Uniform Delay, d1		27.4			30.2		6.7	9.4	6.6	7.6	8.6	6.6
Progression Factor		1.00			1.00		0.68	0.88	0.75	0.29	0.27	0.06
Incremental Delay, d2		5.6			17.4		0.4	1.0	0.2	1.7	0.5	0.1
Delay (s)		33.0			47.5		4.9	9.2	5.2	3.9	2.9	0.5
Level of Service		C			D		A	A	A	A	A	A
Approach Delay (s)		33.0			47.5			9.0			2.8	
Approach LOS		C			D			A			A	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1079: Ashland Ave. □ W Washington Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↑↑	↗	↙	↑↑↑			↑↑↑		
Volume (vph)	0	0	0	19	241	20	26	1001	0	0	964	58	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	10	10	10	11	11	11	11	11	11	
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Util. Factor				1.00	0.95	1.00	1.00	0.91			0.91		
Frbp, ped/bikes				1.00	1.00	0.98	1.00	1.00			1.00		
Flpb, ped/bikes				0.99	1.00	1.00	0.99	1.00			1.00		
Frt				1.00	1.00	0.85	1.00	1.00			0.99		
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1511	3160	1403	1630	4502			4209		
Flt Permitted				0.95	1.00	1.00	0.23	1.00			1.00		
Satd. Flow (perm)				1511	3160	1403	392	4502			4209		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	20	254	21	27	1054	0	0	1015	61	
RTOR Reduction (vph)	0	0	0	0	0	15	0	0	0	0	7	0	
Lane Group Flow (vph)	0	0	0	20	254	6	27	1054	0	0	1069	0	
Confl. Peds. (#/hr)	5		5	5		5	44		27	27		44	
Confl. Bikes (#/hr)			2						1			1	
Heavy Vehicles (%)	0%	0%	0%	5%	1%	0%	0%	2%	0%	0%	3%	0%	
Parking (#/hr)								0				26	
Turn Type				Perm	NA	Perm	Perm	NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8		8	2						
Actuated Green, G (s)				26.0	26.0	26.0	56.0	56.0			56.0		
Effective Green, g (s)				26.0	26.0	26.0	56.0	56.0			56.0		
Actuated g/C Ratio				0.29	0.29	0.29	0.62	0.62			0.62		
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Grp Cap (vph)				436	912	405	243	2801			2618		
v/s Ratio Prot					c0.08			0.23			c0.25		
v/s Ratio Perm				0.01		0.00	0.07						
v/c Ratio				0.05	0.28	0.01	0.11	0.38			0.41		
Uniform Delay, d1				23.1	24.7	22.9	6.9	8.4			8.6		
Progression Factor				1.00	1.00	1.00	0.28	0.25			1.20		
Incremental Delay, d2				0.2	0.8	0.1	0.9	0.4			0.5		
Delay (s)				23.3	25.5	22.9	2.8	2.5			10.8		
Level of Service				C	C	C	A	A			B		
Approach Delay (s)		0.0			25.2			2.5			10.8		
Approach LOS		A			C			A			B		
Intersection Summary													
HCM 2000 Control Delay			8.9		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.37										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			55.3%		ICU Level of Service						B		
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1080: Ashland Ave. □ W Warren Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕↕		↕	↕↕↕	
Volume (vph)	42	194	41	0	0	0	0	1005	2	33	865	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.95						0.91		1.00	0.91	
Frbp, ped/bikes		1.00						1.00		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		0.99	1.00	
Frt		0.98						1.00		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		2951						4047		1479	3888	
Flt Permitted		0.99						1.00		0.23	1.00	
Satd. Flow (perm)		2951						4047		363	3888	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	44	204	43	0	0	0	0	1058	2	35	911	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	275	0	0	0	0	0	1060	0	35	911	0
Confl. Peds. (#/hr)			2	2				30		19	19	30
Confl. Bikes (#/hr)										3		3
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	2%	50%	0%	3%	0%
Parking (#/hr)								0			18	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		26.0						56.0		56.0	56.0	
Effective Green, g (s)		26.0						56.0		56.0	56.0	
Actuated g/C Ratio		0.29						0.62		0.62	0.62	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		852						2518		225	2419	
v/s Ratio Prot								c0.26			0.23	
v/s Ratio Perm		0.09								0.10		
v/c Ratio		0.32						0.42		0.16	0.38	
Uniform Delay, d1		25.1						8.7		7.1	8.4	
Progression Factor		1.00						0.33		0.14	0.12	
Incremental Delay, d2		1.0						0.5		1.4	0.4	
Delay (s)		26.1						3.3		2.4	1.4	
Level of Service		C						A		A	A	
Approach Delay (s)		26.1			0.0			3.3			1.5	
Approach LOS		C			A			A			A	

Intersection Summary

HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1082: Ashland Ave. □ W Madison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	44	307	42	14	414	104	31	876	8	70	819	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		2.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		0.97	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1535	2965		1546	2969		1638	4539		1640	4399	
Flt Permitted	0.45	1.00		0.33	1.00		0.21	1.00		0.21	1.00	
Satd. Flow (perm)	725	2965		534	2969		370	4539		366	4399	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	323	44	15	436	109	33	922	8	74	862	61
RTOR Reduction (vph)	0	12	0	0	14	0	0	1	0	0	9	0
Lane Group Flow (vph)	46	355	0	15	531	0	33	929	0	74	914	0
Confl. Peds. (#/hr)	31		74	74		31	27		23	23		27
Confl. Bikes (#/hr)						3			1			2
Heavy Vehicles (%)	2%	5%	0%	0%	4%	0%	0%	1%	0%	0%	3%	2%
Parking (#/hr)								0				0
Turn Type	Perm	NA		custom	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			3			2			6		
Actuated Green, G (s)	33.0	33.0		49.0	49.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	33.0	33.0		49.0	49.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.37	0.37		0.54	0.54		0.37	0.37		0.37	0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	265	1087		290	1616		135	1664		134	1612	
v/s Ratio Prot		0.12			c0.18			0.20			c0.21	
v/s Ratio Perm	0.06			0.03			0.09			0.20		
v/c Ratio	0.17	0.33		0.05	0.33		0.24	0.56		0.55	0.57	
Uniform Delay, d1	19.3	20.5		9.6	11.4		19.8	22.7		22.6	22.8	
Progression Factor	1.00	1.00		1.00	1.00		0.66	0.74		0.43	0.36	
Incremental Delay, d2	1.4	0.8		0.3	0.5		3.6	1.1		14.7	1.4	
Delay (s)	20.7	21.3		9.9	11.9		16.6	17.8		24.4	9.6	
Level of Service	C	C		A	B		B	B		C	A	
Approach Delay (s)		21.2			11.9			17.8			10.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1083: Ashland Ave. □ W Ogden Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑		↘	↑↑			↑↑	↘		↑↑↑	
Volume (vph)	173	742	0	204	640	0	0	742	335	0	723	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		3.0	4.0			4.0	3.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95	1.00		0.91	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.98		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1708	3353		1636	3241			3241	1300		4267	
Flt Permitted	0.40	1.00		0.15	1.00			1.00	1.00		1.00	
Satd. Flow (perm)	711	3353		253	3241			3241	1300		4267	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	781	0	215	674	0	0	781	353	0	761	160
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	13	0	36	0
Lane Group Flow (vph)	182	781	0	215	674	0	0	781	340	0	885	0
Confl. Peds. (#/hr)	3		7	7		3	22		13	13		22
Confl. Bikes (#/hr)			1			3			3			5
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	0%	2%	0%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	8	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA		pm+pt	NA			NA	pm+ov		NA	
Protected Phases		4		3	8			2	3		6	
Permitted Phases	4			8					2			
Actuated Green, G (s)	27.0	27.0		38.0	38.0			44.0	52.0		44.0	
Effective Green, g (s)	27.0	27.0		38.0	38.0			44.0	52.0		44.0	
Actuated g/C Ratio	0.30	0.30		0.42	0.42			0.49	0.58		0.49	
Clearance Time (s)	4.0	4.0		3.0	4.0			4.0	3.0		4.0	
Lane Grp Cap (vph)	213	1005		229	1368			1584	751		2086	
v/s Ratio Prot		0.23		c0.08	0.21			c0.24	0.04		0.21	
v/s Ratio Perm	0.26			c0.31					0.22			
v/c Ratio	0.85	0.78		0.94	0.49			0.49	0.45		0.42	
Uniform Delay, d1	29.7	28.8		20.0	19.0			15.5	10.9		14.8	
Progression Factor	1.00	1.00		1.00	1.00			1.61	1.11		0.30	
Incremental Delay, d2	33.0	5.9		45.5	1.3			0.9	1.6		0.5	
Delay (s)	62.6	34.7		65.4	20.2			25.8	13.7		5.0	
Level of Service	E	C		E	C			C	B		A	
Approach Delay (s)		39.9			31.2			22.1			5.0	
Approach LOS		D			C			C			A	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1084: Ashland Ave. □ W Monroe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	1	50	33	51	51	20	27	1067	40	29	811	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		0.98	1.00		0.99	1.00	
Frt		0.95			0.98		1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1566			1577		1571	2760		1586	2914	
Flt Permitted		1.00			0.87		0.31	1.00		0.21	1.00	
Satd. Flow (perm)		1564			1400		507	2760		346	2914	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	53	35	54	54	21	28	1123	42	31	854	2
RTOR Reduction (vph)	0	26	0	0	8	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	63	0	0	121	0	28	1162	0	31	856	0
Confl. Peds. (#/hr)	7		17	17		7	18		15	15		18
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	2%	5%	0%	4%	0%
Parking (#/hr)								24	24		0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.0			18.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)		18.0			18.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio		0.20			0.20		0.71	0.71		0.71	0.71	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		312			280		360	1962		246	2072	
v/s Ratio Prot								c0.42				0.29
v/s Ratio Perm		0.04			c0.09		0.06			0.09		
v/c Ratio		0.20			0.43		0.08	0.59		0.13	0.41	
Uniform Delay, d1		30.0			31.5		4.0	6.5		4.1	5.3	
Progression Factor		1.00			1.00		1.01	0.60		0.26	0.25	
Incremental Delay, d2		1.5			4.8		0.3	1.0		0.9	0.5	
Delay (s)		31.5			36.3		4.3	4.9		2.0	1.8	
Level of Service		C			D		A	A		A	A	
Approach Delay (s)		31.5			36.3			4.9			1.8	
Approach LOS		C			D			A			A	

Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1085: Ashland Ave. □ W Adams St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔↔		↕	↑↑			↑↑	↗
Volume (vph)	0	0	0	69	144	83	55	1048	0	0	878	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)					4.0		4.0	4.0			4.0	4.0
Lane Util. Factor					0.95		1.00	0.95			0.95	1.00
Frbp, ped/bikes					0.99		1.00	1.00			1.00	0.92
Flpb, ped/bikes					1.00		0.99	1.00			1.00	1.00
Frt					0.96		1.00	1.00			1.00	0.85
Flt Protected					0.99		0.95	1.00			1.00	1.00
Satd. Flow (prot)					2927		1600	2642			2953	1085
Flt Permitted					0.99		0.26	1.00			1.00	1.00
Satd. Flow (perm)					2927		436	2642			2953	1085
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	73	152	87	58	1103	0	0	924	69
RTOR Reduction (vph)	0	0	0	0	46	0	0	0	0	0	0	27
Lane Group Flow (vph)	0	0	0	0	267	0	58	1103	0	0	924	42
Confl. Peds. (#/hr)	32		8	8		32	33		17	17		33
Confl. Bikes (#/hr)						2			1			1
Heavy Vehicles (%)	0%	0%	0%	1%	2%	1%	2%	2%	0%	0%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								54			12	12
Turn Type				Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8			2					6
Actuated Green, G (s)					27.0		55.0	55.0			55.0	55.0
Effective Green, g (s)					27.0		55.0	55.0			55.0	55.0
Actuated g/C Ratio					0.30		0.61	0.61			0.61	0.61
Clearance Time (s)					4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)					878		266	1614			1804	663
v/s Ratio Prot								c0.42			0.31	
v/s Ratio Perm					0.09		0.13					0.04
v/c Ratio					0.30		0.22	0.68			0.51	0.06
Uniform Delay, d1					24.3		7.9	11.7			9.9	7.1
Progression Factor					1.00		2.31	2.31			0.51	0.47
Incremental Delay, d2					0.9		1.6	2.0			1.0	0.2
Delay (s)					25.1		19.7	29.0			6.1	3.5
Level of Service					C		B	C			A	A
Approach Delay (s)		0.0			25.1			28.5			5.9	
Approach LOS		A			C			C			A	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1086: Ashland Ave. □ W Jackson Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕	↗	↘	↕↕	
Volume (vph)	62	227	105	0	0	0	0	1036	136	55	690	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0					4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95	1.00					0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00	0.97					1.00	0.96	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.99	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3301	1477					3241	1227	1646	2889	
Flt Permitted		0.99	1.00					1.00	1.00	0.20	1.00	
Satd. Flow (perm)		3301	1477					3241	1227	340	2889	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	65	239	111	0	0	0	0	1091	143	58	726	0
RTOR Reduction (vph)	0	0	76	0	0	0	0	0	59	0	0	0
Lane Group Flow (vph)	0	304	35	0	0	0	0	1091	84	58	726	0
Confl. Peds. (#/hr)	6		13	13			6		20	20		9
Heavy Vehicles (%)	0%	3%	1%	0%	0%	0%	2%	2%	1%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)									0		20	
Turn Type	Perm	NA	Perm					NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		28.0	28.0					53.0	53.0	53.0	53.0	
Effective Green, g (s)		28.0	28.0					53.0	53.0	53.0	53.0	
Actuated g/C Ratio		0.31	0.31					0.59	0.59	0.59	0.59	
Clearance Time (s)		5.0	5.0					4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)		1026	459					1908	722	200	1701	
v/s Ratio Prot								c0.34			0.25	
v/s Ratio Perm		0.09	0.02						0.07	0.17		
v/c Ratio		0.30	0.08					0.57	0.12	0.29	0.43	
Uniform Delay, d1		23.5	21.9					11.5	8.2	9.2	10.2	
Progression Factor		1.00	1.00					1.00	1.00	1.64	1.68	
Incremental Delay, d2		0.7	0.3					1.3	0.3	3.2	0.7	
Delay (s)		24.3	22.2					12.7	8.5	18.3	17.7	
Level of Service		C	C					B	A	B	B	
Approach Delay (s)		23.7			0.0			12.2			17.8	
Approach LOS		C			A			B			B	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1088: Ashland Ave. □ W Van Buren St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↑↑	↗	↙	↙↑↑↑			↑↑↑		
Volume (vph)	0	0	0	292	340	185	362	861	0	0	938	157	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	11	11	11	10	10	10	11	11	11	
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Util. Factor				1.00	0.95	1.00	0.86	0.86			0.91		
Frbp, ped/bikes				1.00	1.00	0.97	1.00	1.00			0.99		
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00		
Frt				1.00	1.00	0.85	1.00	1.00			0.98		
Flt Protected				0.95	1.00	1.00	0.95	0.99			1.00		
Satd. Flow (prot)				1621	3179	1399	1346	4077			4339		
Flt Permitted				0.95	1.00	1.00	0.18	0.65			1.00		
Satd. Flow (perm)				1621	3179	1399	256	2690			4339		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	307	358	195	381	906	0	0	987	165	
RTOR Reduction (vph)	0	0	0	0	0	118	0	0	0	0	23	0	
Lane Group Flow (vph)	0	0	0	307	358	77	221	1066	0	0	1129	0	
Confl. Peds. (#/hr)	8					8	15		9	9		15	
Confl. Bikes (#/hr)						3			1			9	
Heavy Vehicles (%)	0%	0%	0%	2%	4%	3%	2%	2%	0%	0%	3%	1%	
Parking (#/hr)								0				0	
Turn Type				Perm	NA	Perm	pm+pt	NA			NA		
Protected Phases					8		5	2			6		
Permitted Phases				8		8	2						
Actuated Green, G (s)				29.0	29.0	29.0	63.0	63.0			48.0		
Effective Green, g (s)				29.0	29.0	29.0	63.0	63.0			48.0		
Actuated g/C Ratio				0.29	0.29	0.29	0.63	0.63			0.48		
Clearance Time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Grp Cap (vph)				470	921	405	281	1847			2082		
v/s Ratio Prot					0.11		c0.09	0.06			0.26		
v/s Ratio Perm				c0.19		0.06	c0.41	0.30					
v/c Ratio				0.65	0.39	0.19	0.79	0.58			0.54		
Uniform Delay, d1				31.1	28.4	26.7	22.8	10.8			18.3		
Progression Factor				1.00	1.00	1.00	0.73	0.35			1.00		
Incremental Delay, d2				6.9	1.2	1.0	13.9	0.9			1.0		
Delay (s)				38.0	29.6	27.7	30.5	4.7			19.3		
Level of Service				D	C	C	C	A			B		
Approach Delay (s)		0.0			32.2			9.1			19.3		
Approach LOS		A			C			A			B		
Intersection Summary													
HCM 2000 Control Delay			18.7		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						12.0		
Intersection Capacity Utilization			68.2%		ICU Level of Service						C		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1089: Ashland Ave. □ W Congress Pkwy

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕↕		↘	↕↕↕	
Volume (vph)	193	267	258	0	0	0	0	1030	471	152	1078	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	10	10	10
Total Lost time (s)		6.0	6.0					4.0		6.0	6.0	
Lane Util. Factor		0.95	1.00					0.91		1.00	0.91	
Frbp, ped/bikes		1.00	1.00					0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.95		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		3289	1471					4234		1580	4258	
Flt Permitted		0.98	1.00					1.00		0.09	1.00	
Satd. Flow (perm)		3289	1471					4234		149	4258	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	203	281	272	0	0	0	0	1084	496	160	1135	0
RTOR Reduction (vph)	0	0	74	0	0	0	0	83	0	0	0	0
Lane Group Flow (vph)	0	484	198	0	0	0	0	1497	0	160	1135	0
Confl. Peds. (#/hr)								2		3	3	2
Heavy Vehicles (%)	3%	1%	4%	0%	0%	0%	0%	2%	1%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm					NA		pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)		25.0	25.0					48.0		63.0	63.0	
Effective Green, g (s)		25.0	25.0					48.0		63.0	63.0	
Actuated g/C Ratio		0.25	0.25					0.48		0.63	0.63	
Clearance Time (s)		6.0	6.0					4.0		6.0	6.0	
Lane Grp Cap (vph)		822	367					2032		251	2682	
v/s Ratio Prot								c0.35		c0.07	0.27	
v/s Ratio Perm		0.15	0.13							0.33		
v/c Ratio		0.59	0.54					0.74		0.64	0.42	
Uniform Delay, d1		33.0	32.5					20.9		26.7	9.3	
Progression Factor		1.00	1.00					0.38		0.76	0.36	
Incremental Delay, d2		3.1	5.6					1.8		9.8	0.4	
Delay (s)		36.1	38.1					9.7		30.3	3.7	
Level of Service		D	D					A		C	A	
Approach Delay (s)		36.8			0.0			9.7			7.0	
Approach LOS		D			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1090: Ashland Ave. □ W Harrison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↔		↘	↔		↘	↔		↘	↔	
Volume (vph)	280	307	121	61	163	54	33	1447	127	53	1145	154
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	0.91	0.91		1.00	0.95		1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.96	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1489	2948		1525	2875		1601	4421		1616	4316	
Flt Permitted	0.50	0.89		0.45	1.00		0.14	1.00		0.09	1.00	
Satd. Flow (perm)	778	2637		728	2875		244	4421		157	4316	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	323	127	64	172	57	35	1523	134	56	1205	162
RTOR Reduction (vph)	0	30	0	0	32	0	0	10	0	0	17	0
Lane Group Flow (vph)	233	482	0	64	197	0	35	1647	0	56	1350	0
Confl. Peds. (#/hr)	29		84	84		29	18		36	36		18
Confl. Bikes (#/hr)			1			2			3			1
Heavy Vehicles (%)	0%	0%	0%	0%	7%	0%	3%	1%	2%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.0	35.0		18.0	18.0		55.0	55.0		55.0	55.0	
Effective Green, g (s)	35.0	35.0		18.0	18.0		55.0	55.0		55.0	55.0	
Actuated g/C Ratio	0.35	0.35		0.18	0.18		0.55	0.55		0.55	0.55	
Clearance Time (s)	3.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	371	966		131	517		134	2431		86	2373	
v/s Ratio Prot	c0.09	0.07			0.07			c0.37			0.31	
v/s Ratio Perm	c0.13	0.10		0.09			0.14			0.36		
v/c Ratio	0.63	0.50		0.49	0.38		0.26	0.68		0.65	0.57	
Uniform Delay, d1	25.1	25.6		36.9	36.1		11.8	16.1		15.8	14.7	
Progression Factor	1.00	1.00		1.00	1.00		0.62	0.58		0.52	0.45	
Incremental Delay, d2	7.8	1.8		12.5	2.1		4.3	1.4		29.8	0.9	
Delay (s)	33.0	27.4		49.3	38.2		11.5	10.8		37.9	7.5	
Level of Service	C	C		D	D		B	B		D	A	
Approach Delay (s)		29.2			40.6			10.8			8.7	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1091: Ashland Ave. □ W Flourney St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔		↔		↔		↔	↑↑↑			↑↑↑	
Volume (vph)	361	0	91	0	1	4	30	1186	6	2	1195	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0		5.0		5.0		4.0	4.0			4.0	
Lane Util. Factor	0.97		1.00		1.00		1.00	0.91			0.91	
Frbp, ped/bikes	1.00		0.98		0.99		1.00	1.00			1.00	
Flpb, ped/bikes	1.00		1.00		1.00		1.00	1.00			1.00	
Frt	1.00		0.85		0.89		1.00	1.00			1.00	
Flt Protected	0.95		1.00		1.00		0.95	1.00			1.00	
Satd. Flow (prot)	3086		1401		1586		1646	4454			4482	
Flt Permitted	0.75		1.00		1.00		0.18	1.00			0.94	
Satd. Flow (perm)	2451		1401		1586		305	4454			4208	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	380	0	96	0	1	4	32	1248	6	2	1258	31
RTOR Reduction (vph)	0	0	58	0	3	0	0	0	0	0	2	0
Lane Group Flow (vph)	380	0	38	0	2	0	32	1254	0	0	1289	0
Confl. Peds. (#/hr)	3		6	6		3	11		18	18		11
Confl. Bikes (#/hr)									2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Parking (#/hr)								0			0	
Turn Type	custom		custom	Perm	NA		Perm	NA		Perm	NA	
Protected Phases					8			2				6
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	26.0		26.0		26.0		65.0	65.0			65.0	
Effective Green, g (s)	26.0		26.0		26.0		65.0	65.0			65.0	
Actuated g/C Ratio	0.26		0.26		0.26		0.65	0.65			0.65	
Clearance Time (s)	5.0		5.0		5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	637		364		412		198	2895			2735	
v/s Ratio Prot					0.00			0.28				
v/s Ratio Perm	c0.16		0.03				0.10				c0.31	
v/c Ratio	0.60		0.10		0.00		0.16	0.43			0.47	
Uniform Delay, d1	32.4		28.1		27.4		6.8	8.5			8.8	
Progression Factor	1.00		1.00		1.00		0.31	0.28			0.36	
Incremental Delay, d2	4.1		0.6		0.0		1.5	0.4			0.5	
Delay (s)	36.5		28.7		27.4		3.6	2.8			3.7	
Level of Service	D		C		C		A	A			A	
Approach Delay (s)		34.9			27.4			2.8			3.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1092: Ashland Ave. □ W Polk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↑↑↑		↕	↑↑↑	
Volume (vph)	219	59	99	14	16	43	24	1135	17	39	1249	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frbp, ped/bikes		0.95			0.94		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.96			0.99		0.98	1.00		0.97	1.00	
Frt		0.96			0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1425			1407		1627	4430		1612	4366	
Flt Permitted		0.79			0.92		0.16	1.00		0.19	1.00	
Satd. Flow (perm)		1159			1310		274	4430		327	4366	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	231	62	104	15	17	45	25	1195	18	41	1315	42
RTOR Reduction (vph)	0	13	0	0	32	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	384	0	0	45	0	25	1212	0	41	1354	0
Confl. Peds. (#/hr)	61		136	136		61	41		46	46		41
Confl. Bikes (#/hr)			10			6			8			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio		0.28			0.28		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		324			366		175	2835		209	2794	
v/s Ratio Prot								0.27			c0.31	
v/s Ratio Perm		c0.33			0.03		0.09			0.13		
v/c Ratio		1.19			0.12		0.14	0.43		0.20	0.48	
Uniform Delay, d1		36.0			26.8		7.1	8.9		7.4	9.4	
Progression Factor		1.00			1.00		0.98	0.90		0.41	0.30	
Incremental Delay, d2		110.3			0.7		1.6	0.5		1.9	0.6	
Delay (s)		146.3			27.5		8.6	8.4		4.9	3.4	
Level of Service		F			C		A	A		A	A	
Approach Delay (s)		146.3			27.5			8.5			3.4	
Approach LOS		F			C			A			A	

Intersection Summary

HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1093: Ashland Ave. □ W Taylor St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑	↗	↘	↑	↗	↘	↑↑↑		↘	↑↑↑	
Volume (vph)	103	238	79	53	127	58	48	896	107	124	1006	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frbp, ped/bikes	1.00	1.00	0.90	1.00	1.00	0.77	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	0.83	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1321	1631	1289	1521	1600	1073	1563	4260		1584	4339	
Flt Permitted	0.63	1.00	1.00	0.44	1.00	1.00	0.22	1.00		0.24	1.00	
Satd. Flow (perm)	873	1631	1289	702	1600	1073	363	4260		396	4339	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	251	83	56	134	61	51	943	113	131	1059	56
RTOR Reduction (vph)	0	0	40	0	0	44	0	15	0	0	6	0
Lane Group Flow (vph)	108	251	43	56	134	17	51	1041	0	131	1109	0
Confl. Peds. (#/hr)	152		57	57		152	77		40	40		77
Confl. Bikes (#/hr)			8			3			3			2
Heavy Vehicles (%)	0%	3%	0%	0%	5%	3%	0%	3%	0%	1%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	8	0	0	8	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	28.0	28.0	28.0	28.0	28.0	28.0	63.0	63.0		63.0	63.0	
Effective Green, g (s)	28.0	28.0	28.0	28.0	28.0	28.0	63.0	63.0		63.0	63.0	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.63	0.63		0.63	0.63	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	244	456	360	196	448	300	228	2683		249	2733	
v/s Ratio Prot		c0.15			0.08			0.24			0.26	
v/s Ratio Perm	0.12		0.03	0.08		0.02	0.14			c0.33		
v/c Ratio	0.44	0.55	0.12	0.29	0.30	0.06	0.22	0.39		0.53	0.41	
Uniform Delay, d1	29.6	30.6	26.8	28.2	28.3	26.3	8.0	9.1		10.2	9.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.61		1.35	1.13	
Incremental Delay, d2	5.7	4.7	0.7	3.6	1.7	0.4	1.4	0.3		6.7	0.4	
Delay (s)	35.3	35.4	27.5	31.8	30.0	26.7	7.1	5.7		20.5	10.8	
Level of Service	D	D	C	C	C	C	A	A		C	B	
Approach Delay (s)		33.9			29.6			5.8			11.8	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1094: Ashland Ave. □ W Roosevelt Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘↗	↑↑	↗	↘↗	↑↑	↗
Volume (vph)	120	1058	204	168	663	105	155	831	161	212	988	108
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.90	1.00	1.00	0.91	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1572	3160	1334	1596	3069	1265	3062	3002	1127	3087	3069	1138
Flt Permitted	0.24	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	397	3160	1334	211	3069	1265	390	3002	1127	478	3069	1138
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	1114	215	177	698	111	163	875	169	223	1040	114
RTOR Reduction (vph)	0	0	148	0	0	76	0	0	58	0	0	76
Lane Group Flow (vph)	126	1114	67	177	698	35	163	875	111	223	1040	38
Confl. Peds. (#/hr)	76		47	47		76	62		78	78		62
Confl. Bikes (#/hr)			4			3			1			6
Heavy Vehicles (%)	1%	1%	0%	0%	4%	2%	1%	1%	0%	0%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0			0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	42.4	31.3	31.3	43.6	31.9	31.9	40.8	33.1	33.1	41.2	33.3	33.3
Effective Green, g (s)	42.4	31.3	31.3	43.6	31.9	31.9	40.8	33.1	33.1	41.2	33.3	33.3
Actuated g/C Ratio	0.42	0.31	0.31	0.44	0.32	0.32	0.41	0.33	0.33	0.41	0.33	0.33
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	989	417	254	979	403	364	993	373	403	1021	378
v/s Ratio Prot	0.05	c0.35		c0.08	0.23		0.03	0.29		c0.04	c0.34	
v/s Ratio Perm	0.13		0.05	0.22		0.03	0.15		0.10	0.18		0.03
v/c Ratio	0.42	1.13	0.16	0.70	0.71	0.09	0.45	0.88	0.30	0.55	1.02	0.10
Uniform Delay, d1	18.9	34.4	24.9	22.2	30.0	23.9	21.8	31.6	24.8	20.7	33.4	23.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.16	0.87	0.81	1.27	0.44	0.02
Incremental Delay, d2	2.0	70.0	0.8	10.1	4.4	0.4	0.8	10.0	1.8	1.6	32.3	0.5
Delay (s)	20.9	104.4	25.7	32.4	34.4	24.3	26.0	37.4	21.8	28.0	46.9	1.1
Level of Service	C	F	C	C	C	C	C	D	C	C	D	A
Approach Delay (s)		85.5			32.9			33.7			40.1	
Approach LOS		F			C			C			D	

Intersection Summary		
HCM 2000 Control Delay	50.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.97	
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	89.2%	ICU Level of Service
Analysis Period (min)	15	
c	Critical Lane Group	

HCM Signalized Intersection Capacity Analysis

1096: Ashland Ave. □ W 13th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	47	1	157	4	1	2	45	1094	0	3	1191	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	11	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.90			0.96		1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1527			1665		1593	2944		1629	2937	
Flt Permitted		0.93			0.91		0.19	1.00		0.22	1.00	
Satd. Flow (perm)		1435			1563		312	2944		372	2937	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	1	165	4	1	2	47	1152	0	3	1254	19
RTOR Reduction (vph)	0	59	0	0	2	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	156	0	0	5	0	47	1152	0	3	1272	0
Confl. Peds. (#/hr)	7		7	7		7	5		28	28		5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	3%	0%	0%	3%	0%
Parking (#/hr)								0				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		17.4			17.4		74.6	74.6		74.6	74.6	
Effective Green, g (s)		17.4			17.4		74.6	74.6		74.6	74.6	
Actuated g/C Ratio		0.17			0.17		0.75	0.75		0.75	0.75	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		249			271		232	2196		277	2191	
v/s Ratio Prot								0.39			c0.43	
v/s Ratio Perm		c0.11			0.00		0.15			0.01		
v/c Ratio		0.62			0.02		0.20	0.52		0.01	0.58	
Uniform Delay, d1		38.3			34.2		3.8	5.3		3.3	5.7	
Progression Factor		1.00			1.00		1.00	1.00		0.50	0.36	
Incremental Delay, d2		6.8			0.1		2.0	0.9		0.0	0.7	
Delay (s)		45.0			34.3		5.8	6.2		1.7	2.7	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		45.0			34.3			6.2			2.7	
Approach LOS		D			C			A			A	

Intersection Summary

HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1098: Ashland Ave. □ W 14th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	140	0	99	3	0	6	90	985	1	3	1151	58
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	10	9	11	10	9
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.98			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99		1.00	1.00		0.99	1.00	
Frt		0.94			0.91		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1607			1601		1653	2793		1642	2943	
Flt Permitted		0.81			0.93		0.17	1.00		0.23	1.00	
Satd. Flow (perm)		1348			1518		293	2793		404	2943	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	0	104	3	0	6	95	1037	1	3	1212	61
RTOR Reduction (vph)	0	24	0	0	7	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	227	0	0	2	0	95	1038	0	3	1269	0
Confl. Peds. (#/hr)			24	24			14		12	12		14
Confl. Bikes (#/hr)			6						5			5
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%	2%	0%
Parking (#/hr)								16				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.0			26.0		71.0	71.0		71.0	71.0	
Effective Green, g (s)		26.0			26.0		71.0	71.0		71.0	71.0	
Actuated g/C Ratio		0.25			0.25		0.68	0.68		0.68	0.68	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		333			375		198	1888		273	1990	
v/s Ratio Prot								0.37			c0.43	
v/s Ratio Perm		c0.17			0.00		0.32			0.01		
v/c Ratio		0.68			0.01		0.48	0.55		0.01	0.64	
Uniform Delay, d1		35.8			29.8		8.1	8.8		5.5	9.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.8			0.0		8.1	1.2		0.1	1.6	
Delay (s)		46.5			29.8		16.3	9.9		5.6	11.3	
Level of Service		D			C		B	A		A	B	
Approach Delay (s)		46.5			29.8			10.5			11.2	
Approach LOS		D			C			B			B	

Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1103: Ashland Ave. □ W 18th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	214	80	119	245	78	59	810	75	95	1120	56
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.91	1.00	1.00	0.77	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.88	1.00	1.00	0.95	1.00	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1399	1647	1293	1485	1631	1063	1596	2706		1528	2684	
Flt Permitted	0.45	1.00	1.00	0.50	1.00	1.00	0.15	1.00		0.24	1.00	
Satd. Flow (perm)	668	1647	1293	783	1631	1063	250	2706		393	2684	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	225	84	125	258	82	62	853	79	100	1179	59
RTOR Reduction (vph)	0	0	46	0	0	57	0	7	0	0	4	0
Lane Group Flow (vph)	40	225	38	125	258	25	62	925	0	100	1234	0
Confl. Peds. (#/hr)	156		59	59		156	79		58	58		79
Confl. Bikes (#/hr)			6			11						4
Heavy Vehicles (%)	0%	2%	0%	2%	3%	4%	0%	3%	1%	1%	5%	0%
Parking (#/hr)								20				20
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	31.0	31.0	31.0	31.0	31.0	31.0	58.0	58.0		58.0	58.0	
Effective Green, g (s)	31.0	31.0	31.0	31.0	31.0	31.0	58.0	58.0		58.0	58.0	
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31	0.58	0.58		0.58	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	207	510	400	242	505	329	145	1569		227	1556	
v/s Ratio Prot		0.14			0.16			0.34			c0.46	
v/s Ratio Perm	0.06		0.03	c0.16		0.02	0.25			0.25		
v/c Ratio	0.19	0.44	0.09	0.52	0.51	0.08	0.43	0.59		0.44	0.79	
Uniform Delay, d1	25.3	27.6	24.5	28.3	28.3	24.4	11.7	13.4		11.8	16.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.91		1.00	1.00	
Incremental Delay, d2	2.1	2.8	0.5	7.7	3.7	0.5	7.6	1.4		6.1	4.2	
Delay (s)	27.4	30.3	25.0	36.0	31.9	24.8	19.2	13.6		17.9	20.6	
Level of Service	C	C	C	D	C	C	B	B		B	C	
Approach Delay (s)		28.7			31.8			13.9			20.4	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1105: Ashland Ave. □ W 19th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	41	42	12	44	67	55	10	931	33	50	1241	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	10	10	10
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.97		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		0.98			0.98		1.00	1.00		1.00	1.00	
Frt		0.98			0.96		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1678			1623		1596	2793		1596	2658	
Flt Permitted		0.83			0.91		0.14	1.00		0.23	1.00	
Satd. Flow (perm)		1432			1491		231	2793		382	2658	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	43	44	13	46	71	58	11	980	35	53	1306	29
RTOR Reduction (vph)	0	6	0	0	18	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	94	0	0	158	0	11	1012	0	53	1333	0
Confl. Peds. (#/hr)	44		50	50		44	46		66	66		46
Confl. Bikes (#/hr)			2			4			6			4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	6%	7%
Parking (#/hr)								14				24
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		62.0	62.0		62.0	62.0	
Effective Green, g (s)		30.0			30.0		62.0	62.0		62.0	62.0	
Actuated g/C Ratio		0.30			0.30		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		429			447		143	1731		236	1647	
v/s Ratio Prot								0.36				c0.50
v/s Ratio Perm		0.07			c0.11		0.05			0.14		
v/c Ratio		0.22			0.35		0.08	0.58		0.22	0.81	
Uniform Delay, d1		26.2			27.4		7.6	11.3		8.4	14.5	
Progression Factor		1.00			1.00		0.31	0.56		0.46	0.68	
Incremental Delay, d2		1.2			2.2		0.9	1.3		1.5	3.2	
Delay (s)		27.4			29.6		3.3	7.6		5.4	13.0	
Level of Service		C			C		A	A		A	B	
Approach Delay (s)		27.4			29.6			7.6			12.7	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1107: Ashland Ave. □ W 21st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Volume (vph)	35	75	22	143	97	27	7	859	64	23	1168	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	10	10	10	10	10
Total Lost time (s)		4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frbp, ped/bikes		0.99			1.00			0.99		1.00	1.00	
Flpb, ped/bikes		1.00			0.99			1.00		0.99	1.00	
Frt		0.98			0.99			0.99		1.00	1.00	
Flt Protected		0.99			0.97			1.00		0.95	1.00	
Satd. Flow (prot)		1719			1687			2744		1518	2728	
Flt Permitted		0.87			0.72			0.95		0.25	1.00	
Satd. Flow (perm)		1522			1255			2596		394	2728	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	79	23	151	102	28	7	904	67	24	1229	40
RTOR Reduction (vph)	0	8	0	0	4	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	131	0	0	277	0	0	973	0	24	1267	0
Confl. Peds. (#/hr)	33		17	17		33	20		18	18		20
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%	0%	3%	2%	4%	7%	0%
Parking (#/hr)								20			12	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.4			27.4			64.6		64.6	64.6	
Effective Green, g (s)		27.4			27.4			64.6		64.6	64.6	
Actuated g/C Ratio		0.27			0.27			0.65		0.65	0.65	
Clearance Time (s)		4.0			4.0			4.0		4.0	4.0	
Vehicle Extension (s)		5.0			5.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		417			343			1677		254	1762	
v/s Ratio Prot											c0.46	
v/s Ratio Perm		0.09			c0.22			0.37		0.06		
v/c Ratio		0.31			0.81			0.58		0.09	0.72	
Uniform Delay, d1		28.8			33.8			10.0		6.7	11.7	
Progression Factor		1.00			1.00			1.00		1.53	1.18	
Incremental Delay, d2		0.9			14.6			1.5		0.5	1.7	
Delay (s)		29.7			48.4			11.5		10.7	15.5	
Level of Service		C			D			B		B	B	
Approach Delay (s)		29.7			48.4			11.5			15.4	
Approach LOS		C			D			B			B	

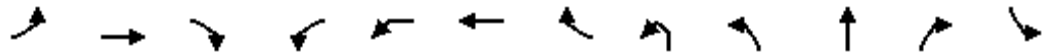
Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	81	242	82	84	172	346	39	33	61	756	91	67
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	12	11	10	11	12	11	10	11	11	11
Total Lost time (s)	4.0	4.0			3.0	4.0			4.0	4.0	4.0	3.0
Lane Util. Factor	1.00	0.95			1.00	0.95			1.00	0.95	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	0.98			1.00	1.00	0.98	1.00
Flpb, ped/bikes	0.90	1.00			1.00	1.00			1.00	1.00	1.00	1.00
Frt	1.00	0.96			1.00	0.98			1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00			0.95	1.00	1.00	0.95
Satd. Flow (prot)	1443	3062			1442	3050			1528	2455	667	1460
Flt Permitted	0.51	1.00			0.32	1.00			0.09	1.00	1.00	0.25
Satd. Flow (perm)	781	3062			484	3050			147	2455	667	378
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	255	86	88	181	364	41	35	64	796	96	71
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	44	0
Lane Group Flow (vph)	85	341	0	0	269	399	0	0	99	796	52	71
Confl. Peds. (#/hr)	99						99		53		6	6
Confl. Bikes (#/hr)			2				6				6	
Heavy Vehicles (%)	0%	4%	2%	10%	11%	5%	3%	9%	2%	3%	11%	13%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	8	0
Parking (#/hr)									74		74	
Turn Type	Perm	NA		pm+pt	pm+pt	NA		pm+pt	pm+pt	NA	Perm	Perm
Protected Phases		4		3	3	8		5	5	2		
Permitted Phases	4			8	8			2	2		2	6
Actuated Green, G (s)	23.0	23.0			39.0	39.0			63.3	63.3	63.3	54.4
Effective Green, g (s)	23.0	23.0			39.0	39.0			63.3	63.3	63.3	54.4
Actuated g/C Ratio	0.18	0.18			0.30	0.30			0.49	0.49	0.49	0.42
Clearance Time (s)	4.0	4.0			3.0	4.0			4.0	4.0	4.0	3.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	138	541			241	915			134	1195	324	158
v/s Ratio Prot		0.11			c0.11	0.13			0.03	c0.32		
v/s Ratio Perm	0.11				c0.22				0.32		0.08	0.19
v/c Ratio	0.62	0.63			1.12	0.44			0.74	0.67	0.16	0.45
Uniform Delay, d1	49.4	49.6			42.5	36.6			49.4	25.3	18.6	27.1
Progression Factor	1.00	1.00			1.00	1.00			1.00	1.00	1.00	1.00
Incremental Delay, d2	18.9	5.5			92.7	0.3			19.0	2.9	1.1	2.0
Delay (s)	68.3	55.1			135.2	37.0			68.5	28.3	19.6	29.1
Level of Service	E	E			F	D			E	C	B	C
Approach Delay (s)		57.7				76.2				31.5		
Approach LOS		E				E				C		

Intersection Summary

HCM 2000 Control Delay	51.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	SBT	SBR	SBR2	NEL2	NEL	NER	NER2
Lane Configurations	↑↑	↔			↔	↔	
Volume (vph)	1103	152	62	4	102	167	49
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	12	11	11	12	12
Total Lost time (s)	3.0	3.0			4.0	4.0	
Lane Util. Factor	0.95	1.00			1.00	1.00	
Frbp, ped/bikes	1.00	0.84			1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	
Frt	1.00	0.85			1.00	0.85	
Flt Protected	1.00	1.00			0.95	1.00	
Satd. Flow (prot)	2944	1016			1637	1425	
Flt Permitted	1.00	1.00			0.99	1.00	
Satd. Flow (perm)	2944	1016			1702	1425	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1161	160	65	4	107	176	52
RTOR Reduction (vph)	0	59	0	0	0	81	0
Lane Group Flow (vph)	1161	166	0	0	111	147	0
Confl. Peds. (#/hr)		53					
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	5%	4%	0%	0%	1%	9%	2%
Bus Blockages (#/hr)	0	8	0	0	0	0	0
Parking (#/hr)	6	6					
Turn Type	NA	Perm		Perm	NA	Perm	
Protected Phases	6				9		
Permitted Phases		6		9		9	
Actuated Green, G (s)	54.4	54.4			15.7	15.7	
Effective Green, g (s)	54.4	54.4			15.7	15.7	
Actuated g/C Ratio	0.42	0.42			0.12	0.12	
Clearance Time (s)	3.0	3.0			4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)	1231	425			205	172	
v/s Ratio Prot	c0.39						
v/s Ratio Perm		0.16			0.07	c0.10	
v/c Ratio	0.94	0.39			0.54	0.86	
Uniform Delay, d1	36.3	26.3			53.8	56.0	
Progression Factor	1.00	1.00			1.00	1.00	
Incremental Delay, d2	14.1	0.6			2.9	31.6	
Delay (s)	50.4	26.9			56.7	87.7	
Level of Service	D	C			E	F	
Approach Delay (s)	45.8				77.5		
Approach LOS	D				E		

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1110: Ashland Ave. □ 2451 S Ashland Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	2	0	4	0	0	1	2	1024	0	2	1359	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.97			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.86		1.00	1.00		1.00	1.00	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1546			1508		1651	3149		1653	3272	
Flt Permitted		1.00			1.00		0.18	1.00		0.26	1.00	
Satd. Flow (perm)		1572			1508		311	3149		460	3272	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	0	4	0	0	1	2	1078	0	2	1431	2
RTOR Reduction (vph)	0	6	0	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	2	1078	0	2	1433	0
Confl. Peds. (#/hr)	1		2	2		1	12		1	1		12
Confl. Bikes (#/hr)									2			4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		1.5			1.5		88.5	88.5		88.5	88.5	
Effective Green, g (s)		1.5			1.5		88.5	88.5		88.5	88.5	
Actuated g/C Ratio		0.02			0.02		0.88	0.88		0.88	0.88	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		23			22		275	2786		407	2895	
v/s Ratio Prot					0.00			0.34			c0.44	
v/s Ratio Perm		c0.00					0.01			0.00		
v/c Ratio		0.00			0.00		0.01	0.39		0.00	0.49	
Uniform Delay, d1		48.5			48.5		0.7	1.0		0.7	1.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.0		0.0	0.4		0.0	0.6	
Delay (s)		48.7			48.5		0.7	1.4		0.7	1.8	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		48.7			48.5			1.4			1.8	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	1.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1111: Ashland Ave. □ 27th Street

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	1	0	1	1008	1360	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)	4.0		3.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frbp, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1710		1652	3210	3210	
Flt Permitted	0.95		0.17	1.00	1.00	
Satd. Flow (perm)	1710		289	3210	3210	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	0	1	1061	1432	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1	0	1	1061	1432	0
Confl. Peds. (#/hr)		10	16			16
Confl. Bikes (#/hr)						3
Heavy Vehicles (%)	0%	0%	0%	3%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	8
Turn Type	NA	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	1.2		79.8	79.8	75.7	
Effective Green, g (s)	1.2		79.8	79.8	75.7	
Actuated g/C Ratio	0.01		0.89	0.89	0.84	
Clearance Time (s)	4.0		3.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	22		272	2846	2699	
v/s Ratio Prot	c0.00		0.00	c0.33	c0.45	
v/s Ratio Perm			0.00			
v/c Ratio	0.05		0.00	0.37	0.53	
Uniform Delay, d1	43.8		1.0	0.9	2.1	
Progression Factor	1.00		1.17	0.91	1.00	
Incremental Delay, d2	0.9		0.0	0.4	0.8	
Delay (s)	44.7		1.1	1.1	2.8	
Level of Service	D		A	A	A	
Approach Delay (s)	44.7			1.1	2.8	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1112: Ashland Ave. □ W Marketplace Access Rd.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	8	18	24	891	1233	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)	4.0	4.0	3.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frbp, ped/bikes	1.00	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1710	1268	1653	2702	2716	
Flt Permitted	0.95	1.00	0.19	1.00	1.00	
Satd. Flow (perm)	1710	1268	325	2702	2716	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	19	25	938	1298	8
RTOR Reduction (vph)	0	18	0	0	0	0
Lane Group Flow (vph)	8	1	25	938	1306	0
Confl. Peds. (#/hr)		2	3			3
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	17%	0%	4%	4%	0%
Parking (#/hr)				40	38	
Turn Type	NA	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	2.9	2.9	78.1	78.1	72.7	
Effective Green, g (s)	2.9	2.9	78.1	78.1	72.7	
Actuated g/C Ratio	0.03	0.03	0.87	0.87	0.81	
Clearance Time (s)	4.0	4.0	3.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	55	40	317	2344	2193	
v/s Ratio Prot	c0.00		0.00	c0.35	c0.48	
v/s Ratio Perm		0.00	0.07			
v/c Ratio	0.15	0.02	0.08	0.40	0.60	
Uniform Delay, d1	42.3	42.2	1.2	1.2	3.2	
Progression Factor	1.00	1.00	1.00	1.00	0.71	
Incremental Delay, d2	1.2	0.2	0.1	0.5	1.1	
Delay (s)	43.6	42.3	1.4	1.7	3.3	
Level of Service	D	D	A	A	A	
Approach Delay (s)	42.7			1.7	3.3	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	3.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1113: Ashland Ave. □ W 31st Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	291	1	158	22	1	13	0	704	22	14	1104	281
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0		4.0			12.0		12.0	12.0	12.0
Lane Util. Factor	0.95	0.95	1.00		1.00			0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00		0.99			1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00		1.00			1.00		0.96	1.00	1.00
Frt	1.00	1.00	0.85		0.95			1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.97			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1525	1529	1232		1160			3154		963	3210	1371
Flt Permitted	0.95	0.95	1.00		0.97			1.00		0.35	1.00	1.00
Satd. Flow (perm)	1525	1529	1232		1160			3154		356	3210	1371
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	306	1	166	23	1	14	0	741	23	15	1162	296
RTOR Reduction (vph)	0	0	119	0	13	0	0	2	0	0	0	129
Lane Group Flow (vph)	153	154	47	0	25	0	0	762	0	15	1162	167
Confl. Peds. (#/hr)	2						2	3		70	70	3
Confl. Bikes (#/hr)										2		2
Heavy Vehicles (%)	3%	0%	20%	41%	0%	46%	0%	3%	32%	64%	3%	5%
Turn Type	Split	NA	Perm	Split	NA			NA		Perm	NA	Perm
Protected Phases	4	4		8	8			2			6	6
Permitted Phases			4							6		6
Actuated Green, G (s)	23.0	23.0	23.0		5.1			61.9		61.9	61.9	61.9
Effective Green, g (s)	23.0	23.0	23.0		5.1			61.9		61.9	61.9	61.9
Actuated g/C Ratio	0.21	0.21	0.21		0.05			0.56		0.56	0.56	0.56
Clearance Time (s)	4.0	4.0	4.0		4.0			12.0		12.0	12.0	12.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	318	319	257		53			1774		200	1806	771
v/s Ratio Prot	0.10	c0.10			c0.02			0.24			c0.36	
v/s Ratio Perm			0.04							0.04		0.12
v/c Ratio	0.48	0.48	0.18		0.47			0.43		0.07	0.64	0.22
Uniform Delay, d1	38.3	38.3	35.8		51.1			13.9		11.0	16.5	12.0
Progression Factor	1.00	1.00	1.00		1.00			0.45		1.00	1.00	1.00
Incremental Delay, d2	5.1	5.2	1.5		6.3			0.6		0.7	1.8	0.6
Delay (s)	43.4	43.4	37.3		57.5			6.9		11.7	18.3	12.6
Level of Service	D	D	D		E			A		B	B	B
Approach Delay (s)		41.3			57.5			6.9			17.1	
Approach LOS		D			E			A			B	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1114: Ashland Ave. □ S Archer Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↑↑↑		↗	↑↑↑			↑↑	↗	↗	↑↑	↗
Volume (vph)	101	621	68	178	972	46	1	566	127	146	799	172
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	11	11	11	11	11	11	12
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0	3.0	3.0	5.0	3.0
Lane Util. Factor	1.00	0.91		1.00	0.91			0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	4542		1623	4408			2963	1166	1566	3033	1145
Flt Permitted	0.14	1.00		0.36	1.00			0.95	1.00	0.28	1.00	1.00
Satd. Flow (perm)	241	4542		622	4408			2827	1166	467	3033	1145
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	106	654	72	187	1023	48	1	596	134	154	841	181
RTOR Reduction (vph)	0	12	0	0	5	0	0	0	71	0	0	9
Lane Group Flow (vph)	106	714	0	187	1066	0	0	597	63	154	841	172
Confl. Peds. (#/hr)	24		69	69		24	25		65	65		25
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	0%	2%	4%	1%	3%	7%	0%	6%	4%	5%	9%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0			18
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4		3	8			2	3	1	6	7
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	53.0	44.0		43.1	37.1			37.0	43.0	47.0	47.0	59.9
Effective Green, g (s)	53.0	44.0		43.1	37.1			37.0	43.0	47.0	47.0	59.9
Actuated g/C Ratio	0.48	0.40		0.39	0.34			0.34	0.39	0.43	0.43	0.54
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0	3.0	3.0	5.0	3.0
Vehicle Extension (s)	5.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	5.0
Lane Grp Cap (vph)	281	1816		298	1486			950	455	269	1295	623
v/s Ratio Prot	c0.04	0.16		c0.03	c0.24				0.01	0.04	c0.28	0.03
v/s Ratio Perm	0.14			0.21				0.21	0.05	0.21		0.12
v/c Ratio	0.38	0.39		0.63	0.72			0.63	0.14	0.57	0.65	0.28
Uniform Delay, d1	17.8	23.5		23.6	31.9			30.7	21.6	21.1	25.0	13.4
Progression Factor	1.00	1.00		1.00	1.00			1.02	0.65	0.54	0.49	0.12
Incremental Delay, d2	1.8	0.1		4.1	3.0			3.1	0.1	2.4	2.0	0.4
Delay (s)	19.6	23.6		27.7	34.9			34.3	14.0	13.8	14.3	2.0
Level of Service	B	C		C	C			C	B	B	B	A
Approach Delay (s)		23.1			33.8			30.6			12.4	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	114.1%	ICU Level of Service	H
Analysis Period (min)	15		
c	Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

1115: Ashland Ave. □ W Robinson St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↕	↗	↖	↕	↗
Volume (vph)	0	0	0	77	58	8	175	600	36	54	934	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	14	12	12	11	12	11	11	12	12	12	12
Total Lost time (s)					4.0	4.0	3.0	4.0		3.0	4.0	
Lane Util. Factor					1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes					1.00	0.97	1.00	1.00		1.00	1.00	
Flpb, ped/bikes					0.99	1.00	1.00	1.00		0.99	1.00	
Frt					1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected					0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1670	1491	1460	3061		1662	3154	
Flt Permitted					0.97	1.00	0.23	1.00		0.40	1.00	
Satd. Flow (perm)					1670	1491	354	3061		695	3154	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	81	61	8	184	632	38	57	983	28
RTOR Reduction (vph)	0	0	0	0	0	7	0	3	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	142	1	184	667	0	57	1010	0
Confl. Peds. (#/hr)	6		10	10		6	22		14	14		22
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	13%	7%	0%	2%	8%	0%
Turn Type				Perm	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8	2			6		
Actuated Green, G (s)					14.6	14.6	87.4	79.2		78.5	73.3	
Effective Green, g (s)					14.6	14.6	87.4	79.2		78.5	73.3	
Actuated g/C Ratio					0.13	0.13	0.79	0.72		0.71	0.67	
Clearance Time (s)					4.0	4.0	3.0	4.0		3.0	4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)					221	197	392	2203		541	2101	
v/s Ratio Prot							c0.05	0.22		0.00	0.32	
v/s Ratio Perm					0.09	0.00	c0.33			0.07		
v/c Ratio					0.64	0.01	0.47	0.30		0.11	0.48	
Uniform Delay, d1					45.2	41.4	4.3	5.5		4.7	9.0	
Progression Factor					1.00	1.00	3.40	0.44		0.59	0.49	
Incremental Delay, d2					6.3	0.0	0.8	0.3		0.1	0.6	
Delay (s)					51.5	41.4	15.4	2.7		2.8	5.1	
Level of Service					D	D	B	A		A	A	
Approach Delay (s)		0.0			50.9			5.5			4.9	
Approach LOS		A			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.5		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			110.0		Sum of lost time (s)					11.0		
Intersection Capacity Utilization			62.8%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1118: Ashland Ave. □ W 33rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔			↕		↖	↗	
Volume (vph)	14	22	27	49	1	39	3	711	17	10	963	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)	4.0	4.0			4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00			0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99			0.99			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00			1.00			1.00		1.00	1.00	
Frt	1.00	0.92			0.94			1.00		1.00	1.00	
Flt Protected	0.95	1.00			0.97			1.00		0.95	1.00	
Satd. Flow (prot)	1701	1603			1544			2565		1588	2904	
Flt Permitted	0.70	1.00			0.84			0.95		0.31	1.00	
Satd. Flow (perm)	1260	1603			1337			2443		510	2904	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	15	23	28	52	1	41	3	748	18	11	1014	2
RTOR Reduction (vph)	0	18	0	0	25	0	0	2	0	0	0	0
Lane Group Flow (vph)	15	33	0	0	69	0	0	767	0	11	1016	0
Confl. Peds. (#/hr)	4		2	2		4	7		5	5		7
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	4%	4%	0%	8%	0%	6%	0%	0%	7%	0%
Parking (#/hr)								50			4	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.0	39.0			39.0			63.0		63.0	63.0	
Effective Green, g (s)	39.0	39.0			39.0			63.0		63.0	63.0	
Actuated g/C Ratio	0.35	0.35			0.35			0.57		0.57	0.57	
Clearance Time (s)	4.0	4.0			4.0			4.0		4.0	4.0	
Lane Grp Cap (vph)	446	568			474			1399		292	1663	
v/s Ratio Prot		0.02									c0.35	
v/s Ratio Perm	0.01				c0.05			0.31		0.02		
v/c Ratio	0.03	0.06			0.15			0.55		0.04	0.61	
Uniform Delay, d1	23.2	23.4			24.2			14.6		10.3	15.4	
Progression Factor	1.00	1.00			1.00			2.05		0.56	0.47	
Incremental Delay, d2	0.1	0.2			0.6			1.4		0.2	1.5	
Delay (s)	23.3	23.6			24.8			31.5		5.9	8.7	
Level of Service	C	C			C			C		A	A	
Approach Delay (s)		23.5			24.8			31.5			8.7	
Approach LOS		C			C			C			A	

Intersection Summary

HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1121: Ashland Ave. □ W 35th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	199	58	56	276	108	75	611	41	110	840	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.92
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1552	1585	1260	1546	1538	1242	1541	2663	945	1471	2708	979
Flt Permitted	0.37	1.00	1.00	0.53	1.00	1.00	0.25	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	604	1585	1260	862	1538	1242	412	2663	945	517	2708	979
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	61	209	61	59	291	114	79	643	43	116	884	76
RTOR Reduction (vph)	0	0	31	0	1	39	0	0	21	0	0	27
Lane Group Flow (vph)	61	209	30	59	301	64	79	643	22	116	884	49
Confl. Peds. (#/hr)	11		12	12		11	17		12	12		17
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	2%	6%	10%	2%	3%	6%	7%	8%	5%	12%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								32	32		36	36
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	33.0	33.0	33.0	33.0	33.0	33.0	62.9	56.3	56.3	67.1	58.4	58.4
Effective Green, g (s)	33.0	33.0	33.0	33.0	33.0	33.0	62.9	56.3	56.3	67.1	58.4	58.4
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.57	0.51	0.51	0.61	0.53	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	181	475	378	258	461	372	303	1362	483	390	1437	519
v/s Ratio Prot		0.13			c0.20		0.02	0.24		c0.02	c0.33	
v/s Ratio Perm	0.10		0.02	0.07		0.05	0.13		0.02	0.16		0.05
v/c Ratio	0.34	0.44	0.08	0.23	0.65	0.17	0.26	0.47	0.05	0.30	0.62	0.09
Uniform Delay, d1	30.0	31.0	27.6	28.9	33.5	28.4	11.4	17.3	13.4	9.7	18.0	12.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.29	0.09
Incremental Delay, d2	5.0	2.9	0.4	2.1	7.0	1.0	0.5	1.2	0.2	0.4	1.7	0.3
Delay (s)	35.0	34.0	28.0	31.0	40.5	29.4	11.8	18.5	13.6	2.8	6.9	1.5
Level of Service	C	C	C	C	D	C	B	B	B	A	A	A
Approach Delay (s)		33.1			36.8			17.5			6.1	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1123: Ashland Ave. □ W 37th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	23	3	15	11	4	19	16	703	6	4	951	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1651			1479		1595	2933		1064	2984	
Flt Permitted		0.81			0.88		0.27	1.00		0.37	1.00	
Satd. Flow (perm)		1369			1324		460	2933		413	2984	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	3	16	12	4	20	17	740	6	4	1001	19
RTOR Reduction (vph)	0	15	0	0	18	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	28	0	0	18	0	17	746	0	4	1019	0
Confl. Peds. (#/hr)	4					4	1					1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	9%	0%	11%	0%	7%	0%	50%	5%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.3			6.3		59.7	59.7		59.7	59.7	
Effective Green, g (s)		6.3			6.3		59.7	59.7		59.7	59.7	
Actuated g/C Ratio		0.08			0.08		0.80	0.80		0.80	0.80	
Clearance Time (s)		4.0			4.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		114			111		366	2334		328	2375	
v/s Ratio Prot								0.25			c0.34	
v/s Ratio Perm		c0.02			0.01		0.04			0.01		
v/c Ratio		0.25			0.16		0.05	0.32		0.01	0.43	
Uniform Delay, d1		32.1			31.9		1.6	2.1		1.6	2.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4			1.4		0.2	0.4		0.1	0.6	
Delay (s)		34.5			33.3		1.9	2.5		1.6	2.9	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		34.5			33.3			2.4			2.9	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	4.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1127: Ashland Ave. □ W Pershing Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Volume (vph)	14	180	146	166	421	118	132	92	80	71	129	62
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	12	12	12	11	12	13
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1653	3119	1396	1585	3119	1321	1629	1350	1149	1366	1446	1354
Flt Permitted	0.50	1.00	1.00	0.58	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	862	3119	1396	961	3119	1321	1629	1350	1149	1366	1446	1354
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	15	189	154	175	443	124	139	97	84	75	136	65
RTOR Reduction (vph)	0	0	96	0	0	66	0	0	66	0	0	55
Lane Group Flow (vph)	15	189	58	175	443	58	139	97	18	75	136	10
Confl. Peds. (#/hr)			3	3			4		4	4		4
Heavy Vehicles (%)	0%	6%	3%	4%	6%	12%	5%	20%	14%	21%	12%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	33.2	31.8	31.8	44.0	39.6	39.6	18.6	18.6	18.6	13.4	13.4	13.4
Effective Green, g (s)	33.2	31.8	31.8	44.0	39.6	39.6	18.6	18.6	18.6	13.4	13.4	13.4
Actuated g/C Ratio	0.39	0.37	0.37	0.52	0.47	0.47	0.22	0.22	0.22	0.16	0.16	0.16
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	349	1166	522	564	1453	615	356	295	251	215	227	213
v/s Ratio Prot	0.00	0.06		c0.03	0.14		c0.09	0.07		0.05	c0.09	
v/s Ratio Perm	0.02		0.04	c0.13		0.04			0.02			0.01
v/c Ratio	0.04	0.16	0.11	0.31	0.30	0.09	0.39	0.33	0.07	0.35	0.60	0.05
Uniform Delay, d1	15.9	17.7	17.4	11.2	14.1	12.7	28.4	27.9	26.4	31.9	33.3	30.4
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
Incremental Delay, d2	0.1	0.3	0.4	0.3	0.5	0.3	3.2	3.0	0.6	1.0	4.2	0.1
Delay (s)	16.0	18.0	17.8	11.5	14.7	13.0	31.6	30.9	26.9	32.9	37.5	30.5
Level of Service	B	B	B	B	B	B	C	C	C	C	D	C
Approach Delay (s)		17.8			13.6			30.1			34.6	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.39	C
Actuated Cycle Length (s)	85.0	Sum of lost time (s)
Intersection Capacity Utilization	57.2%	12.0
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1130: Ashland Ave. □ W 42nd St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	33	19	28	637	1121	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	12	12	11	11	12
Total Lost time (s)	5.0		3.0	3.0	3.0	3.0
Lane Util. Factor	1.00		1.00	0.95	0.95	1.00
Frbp, ped/bikes	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.97		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1566		1541	2673	3179	1442
Flt Permitted	0.97		0.17	1.00	1.00	1.00
Satd. Flow (perm)	1566		275	2673	3179	1442
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	20	29	671	1180	66
RTOR Reduction (vph)	18	0	0	0	0	8
Lane Group Flow (vph)	37	0	29	671	1180	58
Confl. Peds. (#/hr)	4	1	6			6
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	5%	11%	7%	4%	2%
Parking (#/hr)				34		
Turn Type	NA		custom	NA	NA	Perm
Protected Phases	4		5 9	2 9	6	
Permitted Phases			2			6
Actuated Green, G (s)	10.0		77.0	80.0	63.3	63.3
Effective Green, g (s)	10.0		77.0	80.0	63.3	63.3
Actuated g/C Ratio	0.10		0.77	0.80	0.63	0.63
Clearance Time (s)	5.0				3.0	3.0
Vehicle Extension (s)	7.0				3.0	3.0
Lane Grp Cap (vph)	156		347	2138	2012	912
v/s Ratio Prot	c0.02		0.01	c0.25	c0.37	
v/s Ratio Perm			0.06			0.04
v/c Ratio	0.24		0.08	0.31	0.59	0.06
Uniform Delay, d1	41.5		4.7	2.7	10.7	7.0
Progression Factor	1.00		0.08	0.06	1.00	1.00
Incremental Delay, d2	2.8		0.1	0.1	1.3	0.1
Delay (s)	44.3		0.5	0.2	12.0	7.2
Level of Service	D		A	A	B	A
Approach Delay (s)	44.3			0.2	11.7	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1131: Ashland Ave. □ W 42nd Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕↔		↕	↕↔	
Volume (vph)	7	0	21	0	0	4	3	631	1	2	710	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	8	12	12	12	11	11	11	11	12
Total Lost time (s)		5.0			5.0			3.0		5.0	3.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.90			0.86			1.00		1.00	1.00	
Flt Protected		0.99			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1596			1038			2991		1102	2989	
Flt Permitted		0.94			1.00			0.95		0.40	1.00	
Satd. Flow (perm)		1512			1038			2852		461	2989	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	0	22	0	0	4	3	664	1	2	747	4
RTOR Reduction (vph)	0	26	0	0	4	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	3	0	0	0	0	0	668	0	2	751	0
Confl. Peds. (#/hr)							4					4
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	50%	0%	5%	0%	50%	5%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2		13	6	13
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.0			10.0			70.0		70.3	73.3	
Effective Green, g (s)		10.0			10.0			70.0		70.3	73.3	
Actuated g/C Ratio		0.10			0.10			0.70		0.70	0.73	
Clearance Time (s)		5.0			5.0			3.0		5.0		
Vehicle Extension (s)		7.0			7.0			3.0		3.0		
Lane Grp Cap (vph)		151			103			1996		368	2190	
v/s Ratio Prot					0.00					0.00	c0.25	
v/s Ratio Perm		c0.00						c0.23		0.00		
v/c Ratio		0.02			0.00			0.33		0.01	0.34	
Uniform Delay, d1		40.6			40.5			5.9		4.4	4.8	
Progression Factor		1.00			1.00			0.58		0.07	0.04	
Incremental Delay, d2		0.2			0.1			0.4		0.0	0.1	
Delay (s)		40.8			40.6			3.8		0.3	0.3	
Level of Service		D			D			A		A	A	
Approach Delay (s)		40.8			40.6			3.8			0.3	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	2.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1132: Ashland Ave. □ W 43rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷	↷	↶	↷	↷	↶	↷	↷
Volume (vph)	75	95	43	49	160	91	66	456	17	54	693	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	12	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.94
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1590	1566		1484	1585	1265	1600	2771	992	1409	2750	956
Flt Permitted	0.59	1.00		0.63	1.00	1.00	0.32	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	988	1566		985	1585	1265	539	2771	992	667	2750	956
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	100	45	52	168	96	69	480	18	57	729	121
RTOR Reduction (vph)	0	16	0	0	0	70	0	0	8	0	0	54
Lane Group Flow (vph)	79	129	0	52	168	26	69	480	10	57	729	67
Confl. Peds. (#/hr)	4		15	15		4	12		4	4		12
Confl. Bikes (#/hr)			2						2			2
Heavy Vehicles (%)	0%	1%	2%	6%	6%	11%	3%	5%	6%	17%	4%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								28	28		34	34
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	27.0	27.0		27.0	27.0	27.0	61.0	55.4	55.4	61.0	55.4	55.4
Effective Green, g (s)	27.0	27.0		27.0	27.0	27.0	61.0	55.4	55.4	61.0	55.4	55.4
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27	0.61	0.55	0.55	0.61	0.55	0.55
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	266	422		265	427	341	388	1535	549	448	1523	529
v/s Ratio Prot		0.08			c0.11		c0.01	0.17		0.01	c0.27	
v/s Ratio Perm	0.08			0.05		0.02	0.10		0.01	0.07		0.07
v/c Ratio	0.30	0.31		0.20	0.39	0.08	0.18	0.31	0.02	0.13	0.48	0.13
Uniform Delay, d1	29.0	29.0		28.1	29.8	27.2	8.3	12.0	10.0	8.0	13.5	10.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.87	0.93	1.00	0.81	0.62	0.40
Incremental Delay, d2	2.8	1.9		1.7	2.7	0.4	0.5	0.5	0.1	0.3	1.1	0.5
Delay (s)	31.8	30.9		29.8	32.5	27.6	7.7	11.8	10.1	6.7	9.5	4.8
Level of Service	C	C		C	C	C	A	B	B	A	A	A
Approach Delay (s)		31.2			30.6			11.2			8.7	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1133: Ashland Ave. □ W 44th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	13	5	17	29	18	16	28	533	7	7	695	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	11	10	11	11
Total Lost time (s)		5.0			5.0		4.0	4.0		3.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.99	1.00	
Frt		0.93			0.97		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1621			1601		1556	2850		1011	2662	
Flt Permitted		0.90			0.83		0.36	1.00		0.42	1.00	
Satd. Flow (perm)		1484			1366		592	2850		446	2662	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	14	5	18	31	19	17	29	561	7	7	732	34
RTOR Reduction (vph)	0	16	0	0	15	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	21	0	0	52	0	29	568	0	7	764	0
Confl. Peds. (#/hr)	7		3	3		7	23		11	11		23
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	7%	0%	6%	0%	5%	29%	57%	4%	0%
Parking (#/hr)								16			42	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		9.5			9.5		77.3	77.3		81.5	81.5	
Effective Green, g (s)		9.5			9.5		77.3	77.3		81.5	81.5	
Actuated g/C Ratio		0.10			0.10		0.77	0.77		0.82	0.82	
Clearance Time (s)		5.0			5.0		4.0	4.0		3.0	4.0	
Vehicle Extension (s)		5.0			5.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		140			129		457	2203		370	2169	
v/s Ratio Prot								0.20		0.00	c0.29	
v/s Ratio Perm		0.01			c0.04		0.05			0.02		
v/c Ratio		0.15			0.40		0.06	0.26		0.02	0.35	
Uniform Delay, d1		41.5			42.6		2.7	3.2		1.8	2.4	
Progression Factor		1.00			1.00		1.19	1.15		0.07	0.11	
Incremental Delay, d2		1.0			4.2		0.3	0.3		0.0	0.4	
Delay (s)		42.6			46.8		3.5	4.0		0.1	0.7	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		42.6			46.8			4.0			0.7	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1134: Ashland Ave. □ W 45th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	28	10	7	18	6	28	15	484	20	35	697	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		0.99	1.00		0.98	1.00	
Frt		0.98			0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.97			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1691			1611		1587	2658		1476	2706	
Flt Permitted		0.84			0.92		0.32	1.00		0.44	1.00	
Satd. Flow (perm)		1472			1502		539	2658		676	2706	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	11	7	19	6	29	16	509	21	37	734	33
RTOR Reduction (vph)	0	5	0	0	21	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	42	0	0	33	0	16	527	0	37	764	0
Confl. Peds. (#/hr)	11		9	9		11	6		12	12		6
Confl. Bikes (#/hr)						1			2			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	6%	3%	3%
Parking (#/hr)								40			40	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.0			28.0		63.0	63.0		63.0	63.0	
Effective Green, g (s)		28.0			28.0		63.0	63.0		63.0	63.0	
Actuated g/C Ratio		0.28			0.28		0.63	0.63		0.63	0.63	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		412			420		339	1674		425	1704	
v/s Ratio Prot								0.20			c0.28	
v/s Ratio Perm		c0.03			0.02		0.03			0.05		
v/c Ratio		0.10			0.08		0.05	0.31		0.09	0.45	
Uniform Delay, d1		26.7			26.5		7.1	8.5		7.2	9.5	
Progression Factor		1.00			1.00		1.07	0.97		0.41	0.58	
Incremental Delay, d2		0.5			0.4		0.3	0.5		0.4	0.8	
Delay (s)		27.2			26.9		7.8	8.8		3.3	6.4	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.2			26.9			8.7			6.2	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1135: Ashland Ave. □ W 46th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	36	44	37	11	23	40	16	425	35	56	636	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			0.96		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		0.98	1.00		0.92	1.00	
Frt		0.96			0.93		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1643			1559		1569	2634		1474	2606	
Flt Permitted		0.90			0.96		0.35	1.00		0.46	1.00	
Satd. Flow (perm)		1507			1509		576	2634		716	2606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	46	39	12	24	42	17	447	37	59	669	42
RTOR Reduction (vph)	0	17	0	0	30	0	0	6	0	0	5	0
Lane Group Flow (vph)	0	106	0	0	48	0	17	478	0	59	706	0
Confl. Peds. (#/hr)	37		9	9		37	14		39	39		14
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	3%	0%	4%	2%	0%	5%	0%	0%	4%	2%
Parking (#/hr)								38			48	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Effective Green, g (s)		28.0			28.0		64.0	64.0		64.0	64.0	
Actuated g/C Ratio		0.28			0.28		0.64	0.64		0.64	0.64	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		421			422		368	1685		458	1667	
v/s Ratio Prot								0.18			c0.27	
v/s Ratio Perm		c0.07			0.03		0.03			0.08		
v/c Ratio		0.25			0.11		0.05	0.28		0.13	0.42	
Uniform Delay, d1		27.9			26.8		6.7	7.9		7.1	8.9	
Progression Factor		1.00			1.00		0.82	0.89		0.42	0.33	
Incremental Delay, d2		1.4			0.5		0.2	0.4		0.5	0.7	
Delay (s)		29.3			27.3		5.7	7.5		3.5	3.7	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		29.3			27.3			7.4			3.6	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1136: Ashland Ave. □ W 47th St. □ S. McDowell Ave.

8/8/2013



Movement	EBL2	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR2	SBL	SBT
Lane Configurations	↖	↕		↖	↕			↖	↕	↗	↖	↕
Volume (vph)	73	235	28	138	362	81	5	71	357	87	71	513
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	11	11	11
Total Lost time (s)	3.0	5.0		3.0	5.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00	1.00	0.95
Frbp, ped/bikes	1.00	0.99		1.00	0.98			1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.98	1.00	1.00	0.93	1.00
Frt	1.00	0.98		1.00	0.97			1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1492	2855		1532	2787			1578	2534	1464	1425	3020
Flt Permitted	0.42	1.00		0.55	1.00			0.40	1.00	1.00	0.50	1.00
Satd. Flow (perm)	662	2855		884	2787			661	2534	1464	754	3020
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	77	247	29	145	381	85	5	75	376	92	75	540
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	0	47	0	0
Lane Group Flow (vph)	77	267	0	145	470	0	0	75	376	45	75	540
Confl. Peds. (#/hr)			53	53		74		25			75	
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	7%	9%	11%	2%	10%	6%	0%	3%	7%	1%	8%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)								52				0
Turn Type	pm+pt	NA		pm+pt	NA			Perm	NA	Perm	Perm	NA
Protected Phases	7	4		3	8			2	2	2	6	6
Permitted Phases	4			8								
Actuated Green, G (s)	38.4	33.6		40.8	34.8			48.4	48.4	48.4	48.4	48.4
Effective Green, g (s)	38.4	33.6		40.8	34.8			48.4	48.4	48.4	48.4	48.4
Actuated g/C Ratio	0.38	0.34		0.41	0.35			0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	3.0	5.0		3.0	5.0			4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	294	959		399	969			319	1226	708	364	1461
v/s Ratio Prot	0.01	0.09		c0.02	c0.17				0.15			c0.18
v/s Ratio Perm	0.09			0.13				0.11		0.03	0.10	
v/c Ratio	0.26	0.28		0.36	0.49			0.24	0.31	0.06	0.21	0.37
Uniform Delay, d1	20.1	24.3		19.4	25.6			15.0	15.6	13.7	14.8	16.2
Progression Factor	1.00	1.00		1.00	1.00			1.15	1.12	2.04	0.63	0.58
Incremental Delay, d2	0.5	0.7		0.6	1.7			1.7	0.6	0.2	1.2	0.7
Delay (s)	20.6	25.0		20.0	27.3			18.9	18.2	28.2	10.5	10.1
Level of Service	C	C		B	C			B	B	C	B	B
Approach Delay (s)		24.1			25.6				20.0			9.7
Approach LOS		C			C				B			A

Intersection Summary	
HCM 2000 Control Delay	19.0
HCM 2000 Volume to Capacity ratio	0.42
Actuated Cycle Length (s)	100.0
Intersection Capacity Utilization	63.1%
Analysis Period (min)	15
HCM 2000 Level of Service	B
Sum of lost time (s)	12.0
ICU Level of Service	B

HCM Signalized Intersection Capacity Analysis
 1136: Ashland Ave. □ W 47th St. □ S. McDowell Ave.

8/8/2013



Movement	SBR	SWR2
Lane Configurations	↑	↑
Volume (vph)	67	22
Ideal Flow (vphpl)	1800	1800
Lane Width	11	12
Total Lost time (s)	4.0	5.0
Lane Util. Factor	1.00	1.00
Frbp, ped/bikes	0.95	1.00
Flpb, ped/bikes	1.00	1.00
Frt	0.85	0.86
Flt Protected	1.00	1.00
Satd. Flow (prot)	1141	1557
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1141	1557
Peak-hour factor, PHF	0.95	0.95
Adj. Flow (vph)	71	23
RTOR Reduction (vph)	37	15
Lane Group Flow (vph)	34	8
Confl. Peds. (#/hr)	25	
Confl. Bikes (#/hr)		
Heavy Vehicles (%)	7%	0%
Bus Blockages (#/hr)	8	0
Parking (#/hr)	0	
Turn Type	Perm	custom
Protected Phases		
Permitted Phases	6	8
Actuated Green, G (s)	48.4	34.8
Effective Green, g (s)	48.4	34.8
Actuated g/C Ratio	0.48	0.35
Clearance Time (s)	4.0	5.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	552	541
v/s Ratio Prot		
v/s Ratio Perm	0.03	0.01
v/c Ratio	0.06	0.01
Uniform Delay, d1	13.7	21.4
Progression Factor	0.42	1.00
Incremental Delay, d2	0.2	0.0
Delay (s)	6.0	21.4
Level of Service	A	C
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

1137: Ashland Ave. □ W 48th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↗	↑↑			↑↑	
Volume (vph)	0	0	0	22	26	17	30	547	0	0	973	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	12	11	12
Total Lost time (s)					5.0		4.0	4.0			4.0	
Lane Util. Factor					1.00		1.00	0.95			0.95	
Frbp, ped/bikes					0.99		1.00	1.00			0.99	
Flpb, ped/bikes					0.99		0.99	1.00			1.00	
Frt					0.96		1.00	1.00			0.99	
Flt Protected					0.98		0.95	1.00			1.00	
Satd. Flow (prot)					1648		1528	2734			2619	
Flt Permitted					0.98		0.22	1.00			1.00	
Satd. Flow (perm)					1648		360	2734			2619	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	23	27	18	32	576	0	0	1024	44
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	55	0	32	576	0	0	1065	0
Confl. Peds. (#/hr)	21		20	20		21	27		10	10		27
Heavy Vehicles (%)	0%	0%	0%	0%	4%	0%	3%	4%	0%	0%	3%	2%
Parking (#/hr)								36			50	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					24.0		67.0	67.0			67.0	
Effective Green, g (s)					24.0		67.0	67.0			67.0	
Actuated g/C Ratio					0.24		0.67	0.67			0.67	
Clearance Time (s)					5.0		4.0	4.0			4.0	
Lane Grp Cap (vph)					395		241	1831			1754	
v/s Ratio Prot								0.21			c0.41	
v/s Ratio Perm					0.03		0.09					
v/c Ratio					0.14		0.13	0.31			0.61	
Uniform Delay, d1					29.9		6.0	6.9			9.2	
Progression Factor					1.00		0.68	0.66			0.73	
Incremental Delay, d2					0.7		1.1	0.4			1.5	
Delay (s)					30.6		5.2	5.0			8.2	
Level of Service					C		A	A			A	
Approach Delay (s)		0.0			30.6			5.0			8.2	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1138: Ashland Ave. □ W 49th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	43	39	24	12	19	23	16	419	25	52	620	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			1.00		0.97	1.00		0.97	1.00	
Frt		0.97			0.94		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1668			1628		1457	2629		1511	2621	
Flt Permitted		0.87			0.94		0.37	1.00		0.48	1.00	
Satd. Flow (perm)		1478			1542		564	2629		756	2621	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	45	41	25	13	20	24	17	441	26	55	653	29
RTOR Reduction (vph)	0	11	0	0	18	0	0	4	0	0	3	0
Lane Group Flow (vph)	0	100	0	0	39	0	17	463	0	55	679	0
Confl. Peds. (#/hr)	17						17	26		18	18	26
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	2%	0%	4%	0%	0%	4%	6%	4%	8%	2%	3%	0%
Parking (#/hr)								44			50	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.0			24.0		67.0	67.0		67.0	67.0	
Effective Green, g (s)		24.0			24.0		67.0	67.0		67.0	67.0	
Actuated g/C Ratio		0.24			0.24		0.67	0.67		0.67	0.67	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		354			370		377	1761		506	1756	
v/s Ratio Prot								0.18			c0.26	
v/s Ratio Perm		c0.07			0.03		0.03			0.07		
v/c Ratio		0.28			0.10		0.05	0.26		0.11	0.39	
Uniform Delay, d1		31.0			29.6		5.6	6.6		5.9	7.3	
Progression Factor		1.00			1.00		0.63	0.54		0.76	0.59	
Incremental Delay, d2		2.0			0.6		0.2	0.4		0.3	0.5	
Delay (s)		33.0			30.2		3.8	3.9		4.8	4.9	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		33.0			30.2			3.9			4.9	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1139: Ashland Ave. □ W 50th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↕		↗	↕	
Volume (vph)	19	6	16	14	9	35	10	412	8	19	627	24
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.97			0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		0.99			0.99		0.96	1.00		0.96	1.00	
Frt		0.95			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1611			1585		1527	2635		1531	2991	
Flt Permitted		0.89			0.94		0.36	1.00		0.49	1.00	
Satd. Flow (perm)		1460			1513		583	2635		784	2991	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	6	17	15	9	37	11	434	8	20	660	25
RTOR Reduction (vph)	0	13	0	0	27	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	30	0	0	34	0	11	441	0	20	682	0
Confl. Peds. (#/hr)	13		40	40		13	42		25	25		42
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	4%	0%
Parking (#/hr)								44				0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		26.0			26.0		65.0	65.0		65.0	65.0	
Effective Green, g (s)		26.0			26.0		65.0	65.0		65.0	65.0	
Actuated g/C Ratio		0.26			0.26		0.65	0.65		0.65	0.65	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		379			393		378	1712		509	1944	
v/s Ratio Prot								0.17				c0.23
v/s Ratio Perm		0.02			c0.02		0.02			0.03		
v/c Ratio		0.08			0.09		0.03	0.26		0.04	0.35	
Uniform Delay, d1		28.0			28.0		6.2	7.4		6.3	7.9	
Progression Factor		1.00			1.00		0.85	0.79		0.79	0.62	
Incremental Delay, d2		0.4			0.4		0.1	0.4		0.1	0.5	
Delay (s)		28.4			28.4		5.4	6.2		5.1	5.4	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		28.4			28.4			6.1			5.4	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1140: Ashland Ave. □ W 51st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	86	194	46	54	273	44	37	337	26	29	529	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.93	1.00	1.00	0.95	1.00	1.00	0.94
Flpb, ped/bikes	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1478	1631	1354	1494	1527	1308	1626	2544	822	1570	2623	849
Flt Permitted	0.45	1.00	1.00	0.57	1.00	1.00	0.41	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	707	1631	1354	890	1527	1308	701	2544	822	856	2623	849
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	91	204	48	57	287	46	39	355	27	31	557	80
RTOR Reduction (vph)	0	0	32	0	0	29	0	0	10	0	0	34
Lane Group Flow (vph)	91	204	16	57	287	17	39	358	14	31	557	46
Confl. Peds. (#/hr)	29		21	21		29	13		20	20		13
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	5%	3%	0%	4%	10%	2%	0%	5%	4%	3%	4%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								42	42		50	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	34.0	34.0	34.0	34.0	34.0	34.0	57.0	57.0	57.0	57.0	57.0	57.0
Effective Green, g (s)	34.0	34.0	34.0	34.0	34.0	34.0	57.0	57.0	57.0	57.0	57.0	57.0
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	240	554	460	302	519	444	399	1450	468	487	1495	483
v/s Ratio Prot		0.13			c0.19			0.14			c0.21	
v/s Ratio Perm	0.13		0.01	0.06		0.01	0.06		0.02	0.04		0.05
v/c Ratio	0.38	0.37	0.04	0.19	0.55	0.04	0.10	0.25	0.03	0.06	0.37	0.09
Uniform Delay, d1	25.0	24.9	22.0	23.3	26.8	22.1	9.8	10.8	9.4	9.6	11.7	9.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.44	1.30	2.59
Incremental Delay, d2	4.5	1.9	0.1	1.4	4.2	0.2	0.5	0.4	0.1	0.2	0.7	0.4
Delay (s)	29.5	26.8	22.2	24.7	31.0	22.2	10.3	11.2	9.5	14.0	15.9	25.6
Level of Service	C	C	C	C	C	C	B	B	A	B	B	C
Approach Delay (s)		26.9			29.1			11.0			17.0	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1142: Ashland Ave. □ W 53rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔		↗	↕		↖	↕	
Volume (vph)	0	0	0	16	3	13	14	400	4	10	616	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	11	12	12	12	12	10	11	12	10	11	12
Total Lost time (s)					5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes					0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					0.98		1.00	1.00		0.94	1.00	
Frt					0.94		1.00	1.00		1.00	1.00	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1555		1485	2728		1508	2648	
Flt Permitted					0.98		0.37	1.00		0.50	1.00	
Satd. Flow (perm)					1555		571	2728		786	2648	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	17	3	14	15	421	4	11	648	20
RTOR Reduction (vph)	0	0	0	0	10	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	24	0	15	424	0	11	666	0
Confl. Peds. (#/hr)	12		41	41		12	4		30	30		4
Confl. Bikes (#/hr)			4						3			1
Heavy Vehicles (%)	0%	0%	0%	6%	0%	0%	7%	4%	0%	0%	3%	5%
Parking (#/hr)								36			48	
Turn Type				Perm	NA		Perm	NA		Perm	NA	
Protected Phases					8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)					26.0		55.0	55.0		55.0	55.0	
Effective Green, g (s)					26.0		55.0	55.0		55.0	55.0	
Actuated g/C Ratio					0.29		0.61	0.61		0.61	0.61	
Clearance Time (s)					5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)					449		348	1667		480	1618	
v/s Ratio Prot								0.16			c0.25	
v/s Ratio Perm					0.02		0.03			0.01		
v/c Ratio					0.05		0.04	0.25		0.02	0.41	
Uniform Delay, d1					23.1		7.0	8.1		6.9	9.1	
Progression Factor					1.00		1.11	1.48		1.00	1.00	
Incremental Delay, d2					0.2		0.2	0.4		0.1	0.8	
Delay (s)					23.3		8.0	12.3		7.0	9.9	
Level of Service					C		A	B		A	A	
Approach Delay (s)		0.0			23.3			12.1			9.8	
Approach LOS		A			C			B			A	

Intersection Summary

HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1144: Ashland Ave. □ W Garfield Blvd. (WB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↑↑	↗	↙	↑↑			↑↑	↗
Volume (vph)	0	0	0	156	815	63	69	354	0	0	543	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	9	10	10	9	11	11	10	10	10
Total Lost time (s)				5.0	5.0	5.0	5.0	3.0			3.0	3.0
Lane Util. Factor				1.00	0.95	1.00	1.00	0.95			0.95	1.00
Frbp, ped/bikes				1.00	1.00	0.95	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1494	3129	1333	1535	2935			2624	951
Flt Permitted				0.95	1.00	1.00	0.35	1.00			1.00	1.00
Satd. Flow (perm)				1494	3129	1333	568	2935			2624	951
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	164	858	66	73	373	0	0	572	86
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	0	50
Lane Group Flow (vph)	0	0	0	164	858	28	73	373	0	0	572	36
Confl. Peds. (#/hr)	41					41	19		29	29		19
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	3%	2%	2%	0%	7%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	8
Parking (#/hr)								0			38	38
Turn Type				Perm	NA	Perm	custom	NA			NA	Perm
Protected Phases					8		5	2.5			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)				34.0	34.0	34.0	43.0	46.0			38.0	38.0
Effective Green, g (s)				34.0	34.0	34.0	43.0	46.0			38.0	38.0
Actuated g/C Ratio				0.38	0.38	0.38	0.48	0.51			0.42	0.42
Clearance Time (s)				5.0	5.0	5.0	5.0				3.0	3.0
Lane Grp Cap (vph)				564	1182	503	325	1500			1107	401
v/s Ratio Prot					c0.27		0.01	c0.13			c0.22	
v/s Ratio Perm				0.11		0.02	0.09					0.04
v/c Ratio				0.29	0.73	0.06	0.22	0.25			0.52	0.09
Uniform Delay, d1				19.6	24.0	17.8	18.4	12.3			19.2	15.6
Progression Factor				1.00	1.00	1.00	0.28	0.29			0.61	0.87
Incremental Delay, d2				1.3	3.9	0.2	1.5	0.4			1.6	0.4
Delay (s)				20.9	27.9	18.0	6.7	4.0			13.3	13.9
Level of Service				C	C	B	A	A			B	B
Approach Delay (s)		0.0			26.3			4.4			13.4	
Approach LOS		A			C			A			B	

Intersection Summary

HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1145: Ashland Ave. □ W Garfield Blvd. (EB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↘	↑↑	↗					↑↑	↗	↘	↑↑		
Volume (vph)	54	658	111	0	0	0	0	391	123	63	681	0	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	9	10	10	10	10	10	11	11	10	9	11	11	
Total Lost time (s)	5.0	5.0	5.0					3.0	3.0	5.0	5.0		
Lane Util. Factor	1.00	0.95	1.00					0.95	1.00	1.00	0.95		
Frbp, ped/bikes	1.00	1.00	0.96					1.00	0.98	1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00	1.00	1.00		
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1509	3099	1319					2771	1064	1536	3020		
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.46	1.00		
Satd. Flow (perm)	1509	3099	1319					2771	1064	736	3020		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	57	693	117	0	0	0	0	412	129	66	717	0	
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	75	0	0	0	
Lane Group Flow (vph)	57	693	79	0	0	0	0	412	54	66	717	0	
Confl. Peds. (#/hr)			31	31				23		8	8	23	
Confl. Bikes (#/hr)												1	
Heavy Vehicles (%)	2%	3%	4%	0%	0%	0%	0%	5%	0%	0%	4%	0%	
Parking (#/hr)								28	28		0		
Turn Type	Perm	NA	Perm					NA	Perm	custom	NA		
Protected Phases		4						2		1	16		
Permitted Phases	4		4						2	6			
Actuated Green, G (s)	34.0	34.0	34.0					38.0	38.0	43.0	46.0		
Effective Green, g (s)	34.0	34.0	34.0					38.0	38.0	43.0	43.0		
Actuated g/C Ratio	0.38	0.38	0.38					0.42	0.42	0.48	0.48		
Clearance Time (s)	5.0	5.0	5.0					3.0	3.0	5.0			
Lane Grp Cap (vph)	570	1170	498					1169	449	396	1442		
v/s Ratio Prot		c0.22						0.15		0.01	c0.24		
v/s Ratio Perm	0.04		0.06						0.05	0.07			
v/c Ratio	0.10	0.59	0.16					0.35	0.12	0.17	0.50		
Uniform Delay, d1	18.1	22.4	18.5					17.6	15.8	15.8	16.1		
Progression Factor	1.00	1.00	1.00					2.20	6.66	0.54	0.52		
Incremental Delay, d2	0.4	2.2	0.7					0.8	0.5	0.8	1.1		
Delay (s)	18.5	24.7	19.2					39.6	106.0	9.3	9.5		
Level of Service	B	C	B					D	F	A	A		
Approach Delay (s)		23.5			0.0			55.5			9.5		
Approach LOS		C			A			E			A		
Intersection Summary													
HCM 2000 Control Delay			26.4									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			90.0									Sum of lost time (s)	13.0
Intersection Capacity Utilization			104.8%									ICU Level of Service	G
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1148: Ashland Ave. □ W 57th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↕	↕	
Volume (vph)	16	12	46	0	0	0	0	443	20	12	643	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	10	11	11
Total Lost time (s)		5.0						4.0		4.0	4.0	
Lane Util. Factor		1.00						0.95		1.00	0.95	
Frbp, ped/bikes		0.98						1.00		1.00	1.00	
Flpb, ped/bikes		0.99						1.00		0.96	1.00	
Frt		0.92						0.99		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		1585						2703		1539	2638	
Flt Permitted		0.99						1.00		0.46	1.00	
Satd. Flow (perm)		1585						2703		741	2638	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	13	48	0	0	0	0	466	21	13	677	0
RTOR Reduction (vph)	0	34	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	44	0	0	0	0	0	483	0	13	677	0
Confl. Peds. (#/hr)	42		16	16			42	29		22	22	29
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	4%	0%
Parking (#/hr)								40			48	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		27.0						54.0		54.0	54.0	
Effective Green, g (s)		27.0						54.0		54.0	54.0	
Actuated g/C Ratio		0.30						0.60		0.60	0.60	
Clearance Time (s)		5.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		475						1621		444	1582	
v/s Ratio Prot								0.18			c0.26	
v/s Ratio Perm		0.03								0.02		
v/c Ratio		0.09						0.30		0.03	0.43	
Uniform Delay, d1		22.7						8.8		7.3	9.7	
Progression Factor		1.00						0.71		0.29	0.20	
Incremental Delay, d2		0.4						0.5		0.1	0.8	
Delay (s)		23.1						6.6		2.2	2.8	
Level of Service		C						A		A	A	
Approach Delay (s)		23.1			0.0			6.6			2.8	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			5.5					HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		9.0		
Intersection Capacity Utilization			47.0%					ICU Level of Service		A		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

1150: Ashland Ave. □ W 59th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	79	214	61	103	356	34	68	426	64	41	730	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.79	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	0.92	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1578	1541	1074	1475	1585	1358	1577	2813	1102	1596	3020	1195
Flt Permitted	0.41	1.00	1.00	0.58	1.00	1.00	0.25	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	686	1541	1074	896	1585	1358	409	2813	1102	735	3020	1195
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	225	64	108	375	36	72	448	67	43	768	54
RTOR Reduction (vph)	0	0	37	0	0	21	0	0	40	0	0	32
Lane Group Flow (vph)	83	225	27	108	375	15	72	448	27	43	768	22
Confl. Peds. (#/hr)	5		120	120		5	19					19
Heavy Vehicles (%)	1%	9%	5%	0%	6%	3%	0%	4%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								26	26		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	41.6	37.6	37.6	41.6	37.6	37.6	36.4	36.4	36.4	36.4	36.4	36.4
Effective Green, g (s)	41.6	37.6	37.6	41.6	37.6	37.6	36.4	36.4	36.4	36.4	36.4	36.4
Actuated g/C Ratio	0.46	0.42	0.42	0.46	0.42	0.42	0.40	0.40	0.40	0.40	0.40	0.40
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	356	643	448	439	662	567	165	1137	445	297	1221	483
v/s Ratio Prot	0.01	0.15		c0.01	c0.24			0.16			c0.25	
v/s Ratio Perm	0.10		0.02	0.10		0.01	0.18		0.02	0.06		0.02
v/c Ratio	0.23	0.35	0.06	0.25	0.57	0.03	0.44	0.39	0.06	0.14	0.63	0.05
Uniform Delay, d1	14.2	17.9	15.6	14.1	20.0	15.4	19.4	19.0	16.4	17.0	21.4	16.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.44	0.38	0.47	0.38	0.46	0.16
Incremental Delay, d2	0.3	1.5	0.3	0.3	3.5	0.1	7.9	1.0	0.3	1.0	2.4	0.2
Delay (s)	14.5	19.4	15.9	14.4	23.5	15.5	16.5	8.3	8.0	7.5	12.2	2.7
Level of Service	B	B	B	B	C	B	B	A	A	A	B	A
Approach Delay (s)		17.7			21.0			9.3			11.4	
Approach LOS		B			C			A			B	

Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1152: Ashland Ave. □ W 61st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↕	↕	
Volume (vph)	19	9	50	0	0	0	0	507	24	13	790	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	16	16	16	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0		4.0	4.0	
Lane Util. Factor		1.00						0.95		1.00	0.95	
Frbp, ped/bikes		0.98						0.99		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		0.95	1.00	
Frt		0.91						0.99		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		1798						2785		1565	2616	
Flt Permitted		0.99						1.00		0.42	1.00	
Satd. Flow (perm)		1798						2785		688	2616	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	9	53	0	0	0	0	534	25	14	832	0
RTOR Reduction (vph)	0	37	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	45	0	0	0	0	0	555	0	14	832	0
Confl. Peds. (#/hr)	10		16	16			10	28		38	38	28
Confl. Bikes (#/hr)										1		3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Parking (#/hr)								32			54	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		27.0						54.0		54.0	54.0	
Effective Green, g (s)		27.0						54.0		54.0	54.0	
Actuated g/C Ratio		0.30						0.60		0.60	0.60	
Clearance Time (s)		5.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		539						1671		412	1569	
v/s Ratio Prot								0.20			c0.32	
v/s Ratio Perm		0.02								0.02		
v/c Ratio		0.08						0.33		0.03	0.53	
Uniform Delay, d1		22.6						9.0		7.3	10.6	
Progression Factor		1.00						0.45		0.76	1.38	
Incremental Delay, d2		0.3						0.5		0.1	1.1	
Delay (s)		22.9						4.5		5.7	15.7	
Level of Service		C						A		A	B	
Approach Delay (s)		22.9			0.0			4.5			15.5	
Approach LOS		C			A			A			B	

Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1154: Ashland Ave. □ W 63rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	353	90	87	398	47	103	427	64	58	853	112
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00	0.92	1.00	0.99		1.00	1.00	0.70	1.00	0.97	
Flpb, ped/bikes	0.97	1.00	1.00	0.97	1.00		1.00	1.00	1.00	0.94	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1446	1600	1307	1529	1609		1457	3020	854	1424	2606	
Flt Permitted	0.27	1.00	1.00	0.38	1.00		0.17	1.00	1.00	0.46	1.00	
Satd. Flow (perm)	410	1600	1307	610	1609		258	3020	854	691	2606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	372	95	92	419	49	108	449	67	61	898	118
RTOR Reduction (vph)	0	0	39	0	4	0	0	0	37	0	11	0
Lane Group Flow (vph)	47	372	56	92	464	0	108	449	30	61	1005	0
Confl. Peds. (#/hr)	86		72	72		86	122		129	129		122
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	7%	5%	1%	1%	2%	0%	9%	4%	5%	5%	4%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	0
Parking (#/hr)								0	0		36	
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	33.0	33.0	33.0	33.0	33.0		44.0	40.0	40.0	44.0	40.0	
Effective Green, g (s)	33.0	33.0	33.0	33.0	33.0		44.0	40.0	40.0	44.0	40.0	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37		0.49	0.44	0.44	0.49	0.44	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	150	586	479	223	589		179	1342	379	370	1158	
v/s Ratio Prot		0.23			c0.29		c0.03	0.15		0.01	c0.39	
v/s Ratio Perm	0.11		0.04	0.15			0.27		0.03	0.07		
v/c Ratio	0.31	0.63	0.12	0.41	0.79		0.60	0.33	0.08	0.16	0.87	
Uniform Delay, d1	20.4	23.5	18.9	21.3	25.4		14.6	16.3	14.4	12.3	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.98	0.71	0.59	1.47	1.09	
Incremental Delay, d2	5.4	5.2	0.5	5.6	10.2		5.6	0.7	0.4	0.2	8.4	
Delay (s)	25.8	28.7	19.4	26.8	35.6		20.0	12.2	9.0	18.3	33.0	
Level of Service	C	C	B	C	D		B	B	A	B	C	
Approach Delay (s)		26.7			34.1			13.2			32.1	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1156: Ashland Ave. □ W 65th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕↕			↕↕	
Volume (vph)	0	0	0	11	4	27	23	508	0	0	879	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	16	16	16	10	11	11	11	11	11
Total Lost time (s)					5.0		4.0	4.0			4.0	
Lane Util. Factor					1.00		1.00	0.95			0.95	
Frbp, ped/bikes					0.98		1.00	1.00			0.99	
Flpb, ped/bikes					0.99		0.96	1.00			1.00	
Frt					0.91		1.00	1.00			1.00	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					1742		1479	2969			2735	
Flt Permitted					0.99		0.29	1.00			1.00	
Satd. Flow (perm)					1742		456	2969			2735	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	12	4	28	24	535	0	0	925	31
RTOR Reduction (vph)	0	0	0	0	26	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	0	0	0	18	0	24	535	0	0	955	0
Confl. Peds. (#/hr)	5		6	6		5	42		41	41		42
Confl. Bikes (#/hr)			1									3
Heavy Vehicles (%)	0%	0%	0%	9%	0%	0%	4%	3%	0%	0%	3%	0%
Parking (#/hr)								10			36	
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)					5.7		75.3	75.3			75.3	
Effective Green, g (s)					5.7		75.3	75.3			75.3	
Actuated g/C Ratio					0.06		0.84	0.84			0.84	
Clearance Time (s)					5.0		4.0	4.0			4.0	
Vehicle Extension (s)					5.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					110		381	2484			2288	
v/s Ratio Prot								0.18			c0.35	
v/s Ratio Perm					0.01		0.05					
v/c Ratio					0.16		0.06	0.22			0.42	
Uniform Delay, d1					39.9		1.3	1.5			1.8	
Progression Factor					1.00		0.43	0.39			0.23	
Incremental Delay, d2					1.4		0.3	0.2			0.4	
Delay (s)					41.3		0.8	0.8			0.8	
Level of Service					D		A	A			A	
Approach Delay (s)		0.0			41.3			0.8			0.8	
Approach LOS		A			D			A			A	

Intersection Summary

HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1158: Ashland Ave. □ W Marquette Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	315	92	111	354	30	51	495	33	42	787	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	9	10	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.91	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1504	1647	1329	1533	1680	1382	1502	2744	921	1576	2696	840
Flt Permitted	0.38	1.00	1.00	0.40	1.00	1.00	0.21	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	605	1647	1329	643	1680	1382	333	2744	921	680	2696	840
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	332	97	117	373	32	54	521	35	44	828	60
RTOR Reduction (vph)	0	0	63	0	0	21	0	0	21	0	0	37
Lane Group Flow (vph)	49	332	34	117	373	11	54	521	14	44	828	23
Confl. Peds. (#/hr)	21		22	22		21	32		32	32		32
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	2%	2%	4%	0%	0%	0%	6%	3%	0%	0%	3%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								38	38		44	44
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	34.2	31.2	31.2	36.2	32.2	32.2	39.8	35.8	35.8	37.8	34.8	34.8
Effective Green, g (s)	34.2	31.2	31.2	36.2	32.2	32.2	39.8	35.8	35.8	37.8	34.8	34.8
Actuated g/C Ratio	0.38	0.35	0.35	0.40	0.36	0.36	0.44	0.40	0.40	0.42	0.39	0.39
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	259	570	460	298	601	494	199	1091	366	315	1042	324
v/s Ratio Prot	0.01	0.20		c0.02	c0.22		c0.01	0.19		0.00	c0.31	
v/s Ratio Perm	0.07		0.03	0.14		0.01	0.11		0.02	0.05		0.03
v/c Ratio	0.19	0.58	0.07	0.39	0.62	0.02	0.27	0.48	0.04	0.14	0.79	0.07
Uniform Delay, d1	18.4	24.1	19.7	18.6	23.9	18.7	15.7	20.1	16.6	15.7	24.4	17.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.13	1.21	1.00	1.73	1.53	6.40
Incremental Delay, d2	0.4	4.3	0.3	0.9	4.8	0.1	0.7	1.5	0.2	0.2	5.9	0.4
Delay (s)	18.7	28.4	20.0	19.5	28.6	18.8	18.4	25.8	16.8	27.3	43.4	111.9
Level of Service	B	C	C	B	C	B	B	C	B	C	D	F
Approach Delay (s)		25.7			26.0			24.6			47.0	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1160: Ashland Ave. □ W 69th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕	↕	↕↕		↕	↕↕	
Volume (vph)	42	260	50	64	262	34	45	423	74	57	910	97
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	10	11	11	10	11	11
Total Lost time (s)		5.0			5.0	5.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.99			1.00	0.89	1.00	0.99		1.00	0.98	
Flpb, ped/bikes		0.99			0.99	1.00	0.98	1.00		0.96	1.00	
Frt		0.98			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3055			1647	1273	1462	2611		1479	2503	
Flt Permitted		0.84			0.85	1.00	0.20	1.00		0.43	1.00	
Satd. Flow (perm)		2579			1416	1273	305	2611		671	2503	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	44	274	53	67	276	36	47	445	78	60	958	102
RTOR Reduction (vph)	0	15	0	0	0	17	0	16	0	0	9	0
Lane Group Flow (vph)	0	356	0	0	343	19	47	507	0	60	1051	0
Confl. Peds. (#/hr)	91		48	48		91	54		52	52		54
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	0%	3%	10%	0%	5%	3%	7%	3%	0%	4%	4%	2%
Parking (#/hr)								44				56
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		30.0			30.0	30.0	51.0	51.0		51.0	51.0	
Effective Green, g (s)		30.0			30.0	30.0	51.0	51.0		51.0	51.0	
Actuated g/C Ratio		0.33			0.33	0.33	0.57	0.57		0.57	0.57	
Clearance Time (s)		5.0			5.0	5.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		859			472	424	172	1479		380	1418	
v/s Ratio Prot								0.19				c0.42
v/s Ratio Perm		0.14			c0.24	0.02	0.15			0.09		
v/c Ratio		0.41			0.73	0.05	0.27	0.34		0.16	0.74	
Uniform Delay, d1		23.2			26.4	20.3	10.0	10.5		9.3	14.6	
Progression Factor		1.00			1.00	1.00	2.17	2.27		0.31	0.45	
Incremental Delay, d2		1.5			9.4	0.2	3.7	0.6		0.7	2.9	
Delay (s)		24.7			35.8	20.5	25.4	24.4		3.6	9.5	
Level of Service		C			D	C	C	C		A	A	
Approach Delay (s)		24.7			34.4			24.5			9.2	
Approach LOS		C			C			C			A	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1162: Ashland Ave. □ W 71st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	273	69	105	324	84	60	473	23	110	920	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.95	1.00	1.00	0.93	1.00	1.00	0.91
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1524	1647	1366	1553	1663	1342	1563	2969	1132	1567	3049	1171
Flt Permitted	0.36	1.00	1.00	0.44	1.00	1.00	0.18	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	582	1647	1366	718	1663	1342	289	2969	1132	684	3049	1171
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	287	73	111	341	88	63	498	24	116	968	82
RTOR Reduction (vph)	0	0	51	0	0	59	0	0	13	0	0	46
Lane Group Flow (vph)	58	287	22	111	341	29	63	498	11	116	968	36
Confl. Peds. (#/hr)	38		31	31		38	29		20	20		29
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	2%	0%	2%	1%	1%	2%	3%	0%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								10	10		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	31.6	27.6	27.6	31.6	27.6	27.6	43.4	39.4	39.4	43.4	39.4	39.4
Effective Green, g (s)	31.6	27.6	27.6	31.6	27.6	27.6	43.4	39.4	39.4	43.4	39.4	39.4
Actuated g/C Ratio	0.35	0.31	0.31	0.35	0.31	0.31	0.48	0.44	0.44	0.48	0.44	0.44
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	246	505	418	289	509	411	195	1299	495	369	1334	512
v/s Ratio Prot	0.01	0.17		c0.02	c0.21		c0.01	0.17		0.01	c0.32	
v/s Ratio Perm	0.07		0.02	0.12		0.02	0.14		0.01	0.14		0.03
v/c Ratio	0.24	0.57	0.05	0.38	0.67	0.07	0.32	0.38	0.02	0.31	0.73	0.07
Uniform Delay, d1	20.2	26.2	22.0	21.3	27.2	22.1	14.2	17.1	14.4	13.2	20.8	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.49	1.00	0.59	0.49	0.33
Incremental Delay, d2	0.5	4.6	0.2	0.9	6.9	0.3	0.9	0.8	0.1	0.4	2.6	0.2
Delay (s)	20.7	30.8	22.2	22.1	34.1	22.4	10.5	9.3	14.4	8.1	12.7	5.0
Level of Service	C	C	C	C	C	C	B	A	B	A	B	A
Approach Delay (s)		27.9			29.7			9.6			11.7	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1168: Ashland Ave. □ W 74th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕	↕	↕↕		↕	↕↕	
Volume (vph)	23	121	60	43	185	48	35	508	25	55	908	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	10	10	10	10	10	11	11	10	10	10
Total Lost time (s)		5.0	5.0		5.0	5.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.94		1.00	0.97	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		0.99	1.00	0.98	1.00		0.98	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.99	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1581	1303		1613	1392	1306	3017		1459	2883	
Flt Permitted		0.93	1.00		0.92	1.00	0.21	1.00		0.41	1.00	
Satd. Flow (perm)		1484	1303		1498	1392	291	3017		630	2883	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	24	127	63	45	195	51	37	535	26	58	956	63
RTOR Reduction (vph)	0	0	42	0	0	25	0	4	0	0	5	0
Lane Group Flow (vph)	0	151	21	0	240	26	37	557	0	58	1014	0
Confl. Peds. (#/hr)	12		44	44		12	44		19	19		44
Heavy Vehicles (%)	4%	10%	3%	0%	3%	0%	20%	3%	4%	7%	3%	8%
Parking (#/hr)								0				0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		30.0	30.0		30.0	30.0	51.0	51.0		51.0	51.0	
Effective Green, g (s)		30.0	30.0		30.0	30.0	51.0	51.0		51.0	51.0	
Actuated g/C Ratio		0.33	0.33		0.33	0.33	0.57	0.57		0.57	0.57	
Clearance Time (s)		5.0	5.0		5.0	5.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		494	434		499	464	164	1709		357	1633	
v/s Ratio Prot								0.18			c0.35	
v/s Ratio Perm		0.10	0.02		c0.16	0.02	0.13			0.09		
v/c Ratio		0.31	0.05		0.48	0.06	0.23	0.33		0.16	0.62	
Uniform Delay, d1		22.3	20.3		23.8	20.4	9.7	10.4		9.3	13.0	
Progression Factor		1.00	1.00		1.00	1.00	1.96	1.94		0.21	0.37	
Incremental Delay, d2		1.6	0.2		3.3	0.2	3.1	0.5		0.8	1.4	
Delay (s)		23.9	20.5		27.1	20.6	22.1	20.6		2.8	6.2	
Level of Service		C	C		C	C	C	C		A	A	
Approach Delay (s)		22.9			26.0			20.7			6.0	
Approach LOS		C			C			C			A	

Intersection Summary

HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1170: Ashland Ave. □ W 76th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↕	↕↕		↕	↕↕	
Volume (vph)	27	224	35	88	272	71	51	411	64	84	807	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	10	11	11
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.98			0.98		1.00	0.98		1.00	0.99	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3022			3014		1561	2748		1574	2692	
Flt Permitted		0.89			0.80		0.25	1.00		0.44	1.00	
Satd. Flow (perm)		2691			2445		405	2748		729	2692	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	28	236	37	93	286	75	54	433	67	88	849	55
RTOR Reduction (vph)	0	12	0	0	18	0	0	14	0	0	5	0
Lane Group Flow (vph)	0	289	0	0	436	0	54	486	0	88	899	0
Confl. Peds. (#/hr)	6		20	20		6	8		5	5		8
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	4%	3%	0%	1%	2%	1%	2%	4%	0%	1%	4%	2%
Parking (#/hr)								28				38
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2				6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		32.0			32.0		49.0	49.0		49.0	49.0	
Effective Green, g (s)		32.0			32.0		49.0	49.0		49.0	49.0	
Actuated g/C Ratio		0.36			0.36		0.54	0.54		0.54	0.54	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		956			869		220	1496		396	1465	
v/s Ratio Prot								0.18				c0.33
v/s Ratio Perm		0.11			c0.18		0.13			0.12		
v/c Ratio		0.30			0.50		0.25	0.33		0.22	0.61	
Uniform Delay, d1		20.9			22.7		10.8	11.3		10.6	14.0	
Progression Factor		1.00			1.00		0.65	0.61		0.42	0.34	
Incremental Delay, d2		0.8			2.1		2.6	0.6		1.1	1.6	
Delay (s)		21.8			24.8		9.6	7.5		5.6	6.4	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		21.8			24.8			7.7			6.3	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1173: Ashland Ave. □ W 79th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	379	30	63	439	67	62	368	57	48	826	96
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	9	9	10	9	10	11	11	10	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.90	1.00	1.00	0.94	1.00	1.00	0.82	1.00	1.00	0.92
Flpb, ped/bikes	0.98	1.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00	0.91	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1494	1570	1235	1474	1585	1279	1575	2592	760	1371	2712	897
Flt Permitted	0.26	1.00	1.00	0.34	1.00	1.00	0.24	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	415	1570	1235	523	1585	1279	395	2592	760	711	2712	897
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	399	32	66	462	71	65	387	60	51	869	101
RTOR Reduction (vph)	0	0	21	0	0	46	0	1	29	0	0	39
Lane Group Flow (vph)	79	399	11	66	462	25	65	392	25	51	869	62
Confl. Peds. (#/hr)	54		99	99		54	27		68	68		27
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	1%	7%	0%	0%	6%	1%	0%	4%	0%	6%	3%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								38	38		42	42
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	32.0	32.0	32.0	32.0	32.0	32.0	42.0	42.0	42.0	42.0	42.0	42.0
Effective Green, g (s)	32.0	32.0	32.0	32.0	32.0	32.0	42.0	42.0	42.0	42.0	42.0	42.0
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	147	558	439	185	563	454	184	1209	354	331	1265	418
v/s Ratio Prot		0.25			c0.29			0.15			c0.32	
v/s Ratio Perm	0.19		0.01	0.13		0.02	0.16		0.03	0.07		0.07
v/c Ratio	0.54	0.72	0.03	0.36	0.82	0.06	0.35	0.32	0.07	0.15	0.69	0.15
Uniform Delay, d1	23.1	25.1	18.9	21.4	26.4	19.1	15.3	15.1	13.2	13.8	18.8	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.53	1.52	5.24	0.55	0.52	0.22
Incremental Delay, d2	13.4	7.6	0.1	5.3	12.6	0.2	4.9	0.7	0.4	0.9	2.8	0.7
Delay (s)	36.5	32.7	19.0	26.7	39.0	19.3	28.4	23.5	69.7	8.6	12.6	3.7
Level of Service	D	C	B	C	D	B	C	C	E	A	B	A
Approach Delay (s)		32.4			35.3			29.0			11.5	
Approach LOS		C			D			C			B	

Intersection Summary

HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1175: Ashland Ave. □ W 81st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕	↗	↖	↑↑			↑↔		
Volume (vph)	0	0	0	49	45	48	57	639	0	0	901	121	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	10	10	10	9	11	11	11	11	11	
Total Lost time (s)					5.0	5.0	4.0	4.0			4.0		
Lane Util. Factor					1.00	1.00	1.00	0.95			0.95		
Frbp, ped/bikes					1.00	0.96	1.00	1.00			0.98		
Flpb, ped/bikes					0.98	1.00	1.00	1.00			1.00		
Frt					1.00	0.85	1.00	1.00			0.98		
Flt Protected					0.97	1.00	0.95	1.00			1.00		
Satd. Flow (prot)					1591	1343	1480	2723			2514		
Flt Permitted					0.97	1.00	0.19	1.00			1.00		
Satd. Flow (perm)					1591	1343	302	2723			2514		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	52	47	51	60	673	0	0	948	127	
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	0	0	12	0	
Lane Group Flow (vph)	0	0	0	0	99	17	60	673	0	0	1063	0	
Confl. Peds. (#/hr)	25		31	31		25	51		62	62		51	
Confl. Bikes (#/hr)												1	
Heavy Vehicles (%)	0%	0%	0%	0%	2%	2%	4%	2%	0%	0%	3%	2%	
Parking (#/hr)								44				54	
Turn Type				Perm	NA	Perm	Perm	NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8		8	2						
Actuated Green, G (s)					30.0	30.0	51.0	51.0			51.0		
Effective Green, g (s)					30.0	30.0	51.0	51.0			51.0		
Actuated g/C Ratio					0.33	0.33	0.57	0.57			0.57		
Clearance Time (s)					5.0	5.0	4.0	4.0			4.0		
Lane Grp Cap (vph)					530	447	171	1543			1424		
v/s Ratio Prot								0.25			c0.42		
v/s Ratio Perm					0.06	0.01	0.20						
v/c Ratio					0.19	0.04	0.35	0.44			0.75		
Uniform Delay, d1					21.3	20.3	10.5	11.2			14.6		
Progression Factor					1.00	1.00	0.55	0.51			0.32		
Incremental Delay, d2					0.8	0.2	5.2	0.8			3.1		
Delay (s)					22.1	20.4	11.0	6.5			7.8		
Level of Service					C	C	B	A			A		
Approach Delay (s)		0.0			21.5			6.9			7.8		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			8.5		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			64.2%		ICU Level of Service						C		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1177: Ashland Ave. □ W 83rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	287	101	83	297	66	100	591	105	70	855	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	9	11	11	9	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.94	1.00	0.99		1.00	1.00	0.82	1.00	1.00	0.93
Flpb, ped/bikes	0.99	1.00	1.00	0.97	1.00		1.00	1.00	1.00	0.98	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1545	1631	1316	1552	3086		1535	2897	905	1412	2632	850
Flt Permitted	0.47	1.00	1.00	0.42	1.00		0.23	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	769	1631	1316	689	3086		369	2897	905	534	2632	850
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	302	106	87	313	69	105	622	111	74	900	62
RTOR Reduction (vph)	0	0	48	0	21	0	0	0	39	0	0	31
Lane Group Flow (vph)	68	302	58	87	361	0	105	622	72	74	900	31
Confl. Peds. (#/hr)	14		47	47		14	59		65	65		59
Heavy Vehicles (%)	2%	3%	2%	0%	0%	0%	0%	1%	0%	7%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								26	26		52	52
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	28.0	28.0	28.0	28.0	28.0		50.1	44.5	44.5	49.9	44.4	44.4
Effective Green, g (s)	28.0	28.0	28.0	28.0	28.0		50.1	44.5	44.5	49.9	44.4	44.4
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31		0.56	0.49	0.49	0.55	0.49	0.49
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	239	507	409	214	960		277	1432	447	349	1298	419
v/s Ratio Prot		c0.19			0.12		c0.02	0.21		0.01	c0.34	
v/s Ratio Perm	0.09		0.04	0.13			0.19		0.08	0.10		0.04
v/c Ratio	0.28	0.60	0.14	0.41	0.38		0.38	0.43	0.16	0.21	0.69	0.07
Uniform Delay, d1	23.4	26.2	22.3	24.4	24.2		10.6	14.6	12.5	9.7	17.6	12.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.87	1.31	1.95
Incremental Delay, d2	3.0	5.1	0.7	5.6	1.1		0.9	1.0	0.8	0.2	2.3	0.3
Delay (s)	26.4	31.3	23.1	30.1	25.3		11.4	15.6	13.3	8.7	25.2	23.6
Level of Service	C	C	C	C	C		B	B	B	A	C	C
Approach Delay (s)		28.8			26.2			14.8			24.0	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1179: Ashland Ave. □ W 85th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕		↕	↕	
Volume (vph)	30	26	38	0	0	0	0	640	27	29	960	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	9	11	11
Total Lost time (s)		5.0						4.0		4.0	4.0	
Lane Util. Factor		1.00						0.95		1.00	0.95	
Frbp, ped/bikes		0.99						1.00		1.00	1.00	
Flpb, ped/bikes		0.99						1.00		0.98	1.00	
Frt		0.95						0.99		1.00	1.00	
Flt Protected		0.98						1.00		0.95	1.00	
Satd. Flow (prot)		1643						2715		1459	2696	
Flt Permitted		0.98						1.00		0.38	1.00	
Satd. Flow (perm)		1643						2715		583	2696	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	27	40	0	0	0	0	674	28	31	1011	0
RTOR Reduction (vph)	0	35	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	64	0	0	0	0	0	701	0	31	1011	0
Confl. Peds. (#/hr)	11		5	5			11	16		19	19	16
Confl. Bikes (#/hr)										1		1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	3%	3%	0%
Parking (#/hr)								42			44	
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		10.1						68.9		68.9	68.9	
Effective Green, g (s)		10.1						68.9		68.9	68.9	
Actuated g/C Ratio		0.11						0.78		0.78	0.78	
Clearance Time (s)		5.0						4.0		4.0	4.0	
Vehicle Extension (s)		6.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		188						2125		456	2110	
v/s Ratio Prot								0.26			c0.37	
v/s Ratio Perm		0.04								0.05		
v/c Ratio		0.34						0.33		0.07	0.48	
Uniform Delay, d1		35.9						2.8		2.2	3.3	
Progression Factor		1.00						1.00		1.00	1.00	
Incremental Delay, d2		3.0						0.4		0.3	0.8	
Delay (s)		38.9						3.2		2.5	4.1	
Level of Service		D						A		A	A	
Approach Delay (s)		38.9			0.0			3.2			4.1	
Approach LOS		D			A			A			A	

Intersection Summary

HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1181: Ashland Ave. □ W 87th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Volume (vph)	90	757	174	109	918	132	212	544	77	98	698	115
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	10	10	11	10	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.94	1.00	1.00	0.90	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1579	3179	1278	1576	3210	1306	1563	2820	944	1487	2658	865
Flt Permitted	0.13	1.00	1.00	0.20	1.00	1.00	0.19	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	222	3179	1278	329	3210	1306	314	2820	944	570	2658	865
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	797	183	115	966	139	223	573	81	103	735	121
RTOR Reduction (vph)	0	0	77	0	0	56	0	0	53	0	0	60
Lane Group Flow (vph)	95	797	106	115	966	83	223	573	28	103	735	61
Confl. Peds. (#/hr)	39		56	56		39	22		78	78		22
Heavy Vehicles (%)	1%	4%	3%	1%	3%	3%	2%	2%	1%	6%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								32	32		52	52
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	39.7	35.1	35.1	41.5	36.0	36.0	46.4	34.4	34.4	40.4	31.4	31.4
Effective Green, g (s)	39.7	35.1	35.1	41.5	36.0	36.0	46.4	34.4	34.4	40.4	31.4	31.4
Actuated g/C Ratio	0.40	0.35	0.35	0.42	0.36	0.36	0.46	0.34	0.34	0.40	0.31	0.31
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	0.2	3.0	3.0	0.2	3.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0
Lane Grp Cap (vph)	150	1115	448	205	1155	470	295	970	324	312	834	271
v/s Ratio Prot	c0.03	0.25		c0.03	c0.30		c0.09	0.20		0.03	c0.28	
v/s Ratio Perm	0.22		0.08	0.20		0.06	0.26		0.03	0.10		0.07
v/c Ratio	0.63	0.71	0.24	0.56	0.84	0.18	0.76	0.59	0.09	0.33	0.88	0.23
Uniform Delay, d1	21.6	28.1	23.0	20.0	29.3	21.9	19.0	27.0	22.2	19.2	32.5	25.3
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
Incremental Delay, d2	6.3	3.9	1.2	2.1	7.3	0.8	12.4	2.6	0.5	1.3	12.9	1.9
Delay (s)	27.9	32.0	24.2	22.1	36.6	22.7	31.4	29.6	22.7	20.5	45.4	27.3
Level of Service	C	C	C	C	D	C	C	C	C	C	D	C
Approach Delay (s)		30.3			33.6			29.4			40.5	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1185: Ashland Ave. □ W 91st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Volume (vph)	10	3	34	19	3	27	5	710	40	28	990	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	9	11	11	9	11	11
Total Lost time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frbp, ped/bikes		0.97			0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			0.99		1.00	1.00		0.98	1.00	
Frt		0.90			0.93		1.00	0.99		1.00	1.00	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1440			1468		1533	2564		1450	2707	
Flt Permitted		0.92			0.87		0.26	1.00		0.35	1.00	
Satd. Flow (perm)		1332			1307		416	2564		531	2707	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	3	36	20	3	28	5	747	42	29	1042	13
RTOR Reduction (vph)	0	33	0	0	25	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	17	0	0	26	0	5	787	0	29	1055	0
Confl. Peds. (#/hr)	11		9	9		11	6		18	18		6
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	4%	3%	0%
Parking (#/hr)								54			42	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		8.1			8.1		72.9	72.9		72.9	72.9	
Effective Green, g (s)		8.1			8.1		72.9	72.9		72.9	72.9	
Actuated g/C Ratio		0.09			0.09		0.81	0.81		0.81	0.81	
Clearance Time (s)		5.0			5.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		8.0			8.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		119			117		336	2076		430	2192	
v/s Ratio Prot								0.31			c0.39	
v/s Ratio Perm		0.01			c0.02		0.01			0.05		
v/c Ratio		0.14			0.22		0.01	0.38		0.07	0.48	
Uniform Delay, d1		37.8			38.0		1.6	2.3		1.7	2.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.4			4.0		0.1	0.5		0.3	0.8	
Delay (s)		40.2			42.0		1.7	2.9		2.0	3.4	
Level of Service		D			D		A	A		A	A	
Approach Delay (s)		40.2			42.0			2.9			3.4	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1191: Ashland Ave. □ W 95th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	496	62	22	746	156	96	341	25	256	640	169
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	10	11	11	10	11	11	10	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1564	3009	1252	1586	3124		1593	3020	1210	1503	3049	1215
Flt Permitted	0.12	1.00	1.00	0.40	1.00		0.30	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	195	3009	1252	666	3124		507	3020	1210	689	3049	1215
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	163	522	65	23	785	164	101	359	26	269	674	178
RTOR Reduction (vph)	0	1	36	0	16	0	0	0	18	0	0	66
Lane Group Flow (vph)	163	528	22	23	933	0	101	359	8	269	674	112
Confl. Peds. (#/hr)	30		39	39		30	18		52	52		18
Heavy Vehicles (%)	2%	5%	2%	0%	2%	4%	0%	4%	0%	5%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	8	0	0	8
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	45.8	40.4	40.4	39.2	36.8		41.8	31.8	31.8	49.2	36.2	36.2
Effective Green, g (s)	45.8	40.4	40.4	39.2	36.8		41.8	31.8	31.8	49.2	36.2	36.2
Actuated g/C Ratio	0.44	0.38	0.38	0.37	0.35		0.40	0.30	0.30	0.47	0.34	0.34
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		4.0	3.0	3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	163	1157	481	269	1094		305	914	366	434	1051	418
v/s Ratio Prot	c0.06	0.18		0.00	0.30		0.03	0.12		c0.08	c0.22	
v/s Ratio Perm	c0.38		0.02	0.03			0.10		0.01	0.21		0.09
v/c Ratio	1.00	0.46	0.05	0.09	0.85		0.33	0.39	0.02	0.62	0.64	0.27
Uniform Delay, d1	25.5	24.1	20.2	21.0	31.6		20.6	29.0	25.7	18.4	28.9	24.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	70.5	1.3	0.2	0.1	8.4		0.9	1.3	0.1	3.0	3.0	1.6
Delay (s)	96.0	25.4	20.4	21.1	40.0		21.5	30.2	25.8	21.4	31.9	26.4
Level of Service	F	C	C	C	D		C	C	C	C	C	C
Approach Delay (s)		40.4			39.6			28.2			28.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Build Alternative Level of Service Reports

HCM Signalized Intersection Capacity Analysis

1003: Ashland Ave. □ W Grace St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	56	92	48	0	0	0	0	722	36	0	660	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.98						0.99			1.00	
Flpb, ped/bikes		0.95						1.00			1.00	
Frt		0.97						0.99			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1416						1124			1208	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1416						1124			1208	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.97	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	62	101	53	0	0	0	0	793	40	0	725	8
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	216	0	0	0	0	0	833	0	0	733	0
Confl. Peds. (#/hr)	62		25				62			19		16
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%	0%	4%	3%	3%	2%	0%
Parking (#/hr)								44			38	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		22.0						100.0			100.0	
Effective Green, g (s)		22.0						100.0			100.0	
Actuated g/C Ratio		0.17						0.77			0.77	
Clearance Time (s)		4.0						4.0			4.0	
Lane Grp Cap (vph)		239						864			929	
v/s Ratio Prot								c0.74			0.61	
v/s Ratio Perm		0.15										
v/c Ratio		0.90						0.96			0.79	
Uniform Delay, d1		53.0						13.4			8.8	
Progression Factor		1.00						0.85			1.45	
Incremental Delay, d2		37.8						20.3			2.2	
Delay (s)		90.7						31.7			15.0	
Level of Service		F						C			B	
Approach Delay (s)		90.7			0.0			31.7			15.0	
Approach LOS		F			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			32.0					HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			130.0					Sum of lost time (s)			8.0	
Intersection Capacity Utilization			67.9%					ICU Level of Service			C	
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

1005: Ashland Ave. □ W Addison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	175	566	65	136	507	31	0	354	47	0	616	46
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	10	10	9	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.92		1.00	0.93		1.00	0.82
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1500	1514	1363	1451	1558	1191		1143	810		1250	866
Flt Permitted	0.24	1.00	1.00	0.18	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	381	1514	1363	282	1558	1191		1143	810		1250	866
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	192	622	71	149	557	34	0	389	52	0	677	51
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	192	622	71	149	557	34	0	389	52	0	677	51
Confl. Peds. (#/hr)	28		11	11		28			16			49
Confl. Bikes (#/hr)			2			1			1			2
Heavy Vehicles (%)	1%	7%	0%	10%	4%	10%	8%	5%	17%	2%	3%	4%
Parking (#/hr)								42	42		32	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	58.0	58.0	58.0	58.0	58.0	58.0		63.0	63.0		63.0	63.0
Effective Green, g (s)	58.0	58.0	58.0	58.0	58.0	58.0		63.0	63.0		63.0	63.0
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45		0.48	0.48		0.48	0.48
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	169	675	608	125	695	531		553	392		605	419
v/s Ratio Prot		0.41			0.36			0.34			c0.54	
v/s Ratio Perm	0.50		0.05	c0.53		0.03			0.06			0.06
v/c Ratio	1.14	0.92	0.12	1.19	0.80	0.06		0.70	0.13		1.12	0.12
Uniform Delay, d1	36.0	33.9	21.0	36.0	31.0	20.5		26.2	18.5		33.5	18.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.69	0.83		0.80	0.93
Incremental Delay, d2	110.5	18.1	0.1	141.1	6.6	0.1		6.2	0.6		66.6	0.3
Delay (s)	146.5	51.9	21.1	177.1	37.7	20.6		24.4	15.9		93.2	17.4
Level of Service	F	D	C	F	D	C		C	B		F	B
Approach Delay (s)		70.0			65.0			23.4			87.9	
Approach LOS		E			E			C			F	

Intersection Summary

HCM 2000 Control Delay	66.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1007: Ashland Ave. □ W Roscoe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↑			↑	↗
Volume (vph)	0	0	0	92	197	64	0	464	0	0	614	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11
Total Lost time (s)					4.0			4.0			4.0	4.0
Lane Util. Factor					1.00			1.00			1.00	1.00
Frbp, ped/bikes					0.97			1.00			1.00	0.87
Flpb, ped/bikes					0.99			1.00			1.00	1.00
Frt					0.98			1.00			1.00	0.85
Flt Protected					0.99			1.00			1.00	1.00
Satd. Flow (prot)					1606			1428			1126	841
Flt Permitted					0.99			1.00			1.00	1.00
Satd. Flow (perm)					1606			1428			1126	841
Peak-hour factor, PHF	0.95	0.95	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	0	0	0	101	216	70	0	510	0	0	675	60
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	387	0	0	510	0	0	675	60
Confl. Peds. (#/hr)			13	13		43			18			20
Confl. Bikes (#/hr)			2			1						4
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	6%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								6			48	48
Turn Type				Perm	NA			NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases				8								6
Actuated Green, G (s)					35.0			87.0			87.0	87.0
Effective Green, g (s)					35.0			87.0			87.0	87.0
Actuated g/C Ratio					0.27			0.67			0.67	0.67
Clearance Time (s)					4.0			4.0			4.0	4.0
Lane Grp Cap (vph)					432			955			753	562
v/s Ratio Prot								0.36			c0.60	
v/s Ratio Perm					0.24							0.07
v/c Ratio					0.90			0.53			0.90	0.11
Uniform Delay, d1					45.7			11.1			17.8	7.7
Progression Factor					1.00			1.46			0.40	0.62
Incremental Delay, d2					23.8			1.4			5.4	0.1
Delay (s)					69.5			17.6			12.4	4.9
Level of Service					E			B			B	A
Approach Delay (s)		0.0			69.5			17.6			11.8	
Approach LOS		A			E			B			B	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1009: Ashland Ave. □ W School St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	129	280	19	16	10	10	0	457	8	0	564	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.98			1.00			0.99	
Flpb, ped/bikes		0.98			0.99			1.00			1.00	
Frt		0.99			0.96			1.00			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1590			1523			1304			1493	
Flt Permitted		0.89			0.80			1.00			1.00	
Satd. Flow (perm)		1429			1247			1304			1493	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	142	308	21	18	11	11	0	502	9	0	620	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	471	0	0	40	0	0	511	0	0	660	0
Confl. Peds. (#/hr)	24		35	35		24			24			33
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	2%	0%	5%	0%	0%	0%	0%	5%	0%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								22			0	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		51.0			51.0			71.0			71.0	
Effective Green, g (s)		51.0			51.0			71.0			71.0	
Actuated g/C Ratio		0.39			0.39			0.55			0.55	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		560			489			712			815	
v/s Ratio Prot								0.39			c0.44	
v/s Ratio Perm		c0.33			0.03							
v/c Ratio		0.84			0.08			0.72			0.81	
Uniform Delay, d1		35.8			24.8			22.0			24.0	
Progression Factor		1.00			1.00			0.35			0.53	
Incremental Delay, d2		14.2			0.3			0.6			3.8	
Delay (s)		50.0			25.1			8.3			16.6	
Level of Service		D			C			A			B	
Approach Delay (s)		50.0			25.1			8.3			16.6	
Approach LOS		D			C			A			B	

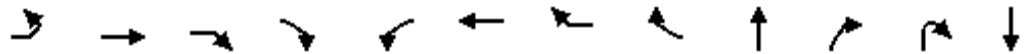
Intersection Summary

HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	EBL2	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBT	NBR	NBR2	SBT
Lane Configurations		↑				↑	↑		↑	↑		↑
Volume (vph)	4	435	105	40	2	285	135	43	595	73	1	513
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	12	11	10	12	11	11	11	11
Total Lost time (s)		5.0				5.0	5.0		6.0	6.0		6.0
Lane Util. Factor		1.00				1.00	1.00		1.00	1.00		1.00
Frbp, ped/bikes		0.96				1.00	0.88		1.00	0.84		1.00
Flpb, ped/bikes		1.00				1.00	1.00		1.00	1.00		1.00
Frt		0.97				1.00	0.85		1.00	0.85		1.00
Flt Protected		1.00				1.00	1.00		1.00	1.00		1.00
Satd. Flow (prot)		1516				1706	1133		1293	916		1535
Flt Permitted		1.00				1.00	1.00		1.00	1.00		1.00
Satd. Flow (perm)		1513				1702	1133		1293	916		1535
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	4	478	115	44	2	313	148	47	654	80	1	564
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	641	0	0	0	315	195	0	654	81	0	564
Confl. Peds. (#/hr)			51		51		42			47		
Confl. Bikes (#/hr)			8									
Heavy Vehicles (%)	0%	7%	7%	5%	0%	2%	13%	5%	5%	3%	100%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	3	0	0
Parking (#/hr)									24	24		0
Turn Type	Perm	NA			Perm	NA	Perm		NA	Perm		NA
Protected Phases		10				14			2			6
Permitted Phases	10				14		14			2		
Actuated Green, G (s)		40.0				40.0	40.0		47.0	47.0		47.0
Effective Green, g (s)		40.0				40.0	40.0		47.0	47.0		47.0
Actuated g/C Ratio		0.31				0.31	0.31		0.36	0.36		0.36
Clearance Time (s)		5.0				5.0	5.0		6.0	6.0		6.0
Lane Grp Cap (vph)		465				523	348		467	331		554
v/s Ratio Prot									c0.51			0.37
v/s Ratio Perm		c0.42				0.19	0.17			0.09		
v/c Ratio		1.38				0.60	0.56		1.40	0.24		1.02
Uniform Delay, d1		45.0				38.2	37.6		41.5	29.1		41.5
Progression Factor		1.00				1.00	1.00		0.80	0.80		0.76
Incremental Delay, d2		183.4				5.1	6.4		189.1	1.2		33.9
Delay (s)		228.4				43.3	44.0		222.5	24.5		65.5
Level of Service		F				D	D		F	C		E
Approach Delay (s)		228.4				43.6			200.7			63.9
Approach LOS		F				D			F			E

Intersection Summary

HCM 2000 Control Delay	162.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	111.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	SBR	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR	NWR2
Lane Configurations										
Volume (vph)	24	27	342	111	1	7	16	240	61	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	9	11	11	11	12	9	11	11	11
Total Lost time (s)	6.0	6.0	6.0				6.0	6.0		
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00		
Frbp, ped/bikes	0.94	1.00	1.00				1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00		
Frt	0.85	1.00	0.96				1.00	0.97		
Flt Protected	1.00	0.95	1.00				0.95	1.00		
Satd. Flow (prot)	1391	1386	1623				1539	1662		
Flt Permitted	1.00	0.18	1.00				0.15	1.00		
Satd. Flow (perm)	1391	261	1623				249	1662		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	26	30	376	122	1	8	18	264	67	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	26	30	499	0	0	0	26	334	0	0
Confl. Peds. (#/hr)	26									
Confl. Bikes (#/hr)										
Heavy Vehicles (%)	0%	11%	3%	4%	0%	0%	0%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										
Turn Type	Perm	Perm	NA			Perm	Perm	NA		
Protected Phases			4					8		
Permitted Phases	6	4				8	8			
Actuated Green, G (s)	47.0	26.0	26.0				26.0	26.0		
Effective Green, g (s)	47.0	26.0	26.0				26.0	26.0		
Actuated g/C Ratio	0.36	0.20	0.20				0.20	0.20		
Clearance Time (s)	6.0	6.0	6.0				6.0	6.0		
Lane Grp Cap (vph)	502	52	324				49	332		
v/s Ratio Prot			c0.31					0.20		
v/s Ratio Perm	0.02	0.12					0.10			
v/c Ratio	0.05	0.58	1.54				0.53	1.01		
Uniform Delay, d1	27.0	47.0	52.0				46.5	52.0		
Progression Factor	1.02	1.00	1.00				1.00	1.00		
Incremental Delay, d2	0.1	39.2	258.0				35.5	50.9		
Delay (s)	27.5	86.2	310.0				82.1	102.9		
Level of Service	C	F	F				F	F		
Approach Delay (s)			297.3					101.4		
Approach LOS			F					F		

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1012: Ashland Ave. □ W Barry Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↑			↑	
Volume (vph)	0	0	0	146	179	5	0	633	0	0	591	61
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frbp, ped/bikes					1.00			1.00			0.97	
Flpb, ped/bikes					0.98			1.00			1.00	
Frt					1.00			1.00			0.99	
Flt Protected					0.98			1.00			1.00	
Satd. Flow (prot)					1919			1333			1220	
Flt Permitted					0.98			1.00			1.00	
Satd. Flow (perm)					1919			1333			1220	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Adj. Flow (vph)	0	0	0	160	197	5	0	696	0	0	649	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	362	0	0	696	0	0	716	0
Confl. Peds. (#/hr)			19	19		54			130			48
Confl. Bikes (#/hr)						2			1			1
Heavy Vehicles (%)	0%	0%	0%	1%	1%	0%	0%	7%	0%	0%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								16			30	30
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					31.0			91.0			91.0	
Effective Green, g (s)					31.0			91.0			91.0	
Actuated g/C Ratio					0.24			0.70			0.70	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					457			933			854	
v/s Ratio Prot								0.52			c0.59	
v/s Ratio Perm					0.19							
v/c Ratio					0.79			0.75			0.84	
Uniform Delay, d1					46.5			12.2			14.2	
Progression Factor					1.00			0.33			1.16	
Incremental Delay, d2					13.2			4.2			1.0	
Delay (s)					59.6			8.2			17.4	
Level of Service					E			A			B	
Approach Delay (s)		0.0			59.6			8.2			17.4	
Approach LOS		A			E			A			B	
Intersection Summary												
HCM 2000 Control Delay			22.4									C
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			130.0							8.0		
Intersection Capacity Utilization			69.3%									C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1014: Ashland Ave. □ W Wellington Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	52	141	112	0	0	0	0	524	35	0	568	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.99						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.95						0.99			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1656						1259			1433	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1656						1259			1433	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.96	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	57	155	123	0	0	0	0	576	38	0	624	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	335	0	0	0	0	0	614	0	0	636	0
Confl. Peds. (#/hr)	8		1				8		1			2
Heavy Vehicles (%)	4%	1%	0%	0%	0%	0%	2%	13%	0%	0%	4%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								16	16		8	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		38.0						84.0			84.0	
Effective Green, g (s)		38.0						84.0			84.0	
Actuated g/C Ratio		0.29						0.65			0.65	
Clearance Time (s)		4.0						4.0			4.0	
Lane Grp Cap (vph)		484						813			925	
v/s Ratio Prot								c0.49			0.44	
v/s Ratio Perm		0.20										
v/c Ratio		0.69						0.76			0.69	
Uniform Delay, d1		40.8						15.9			14.6	
Progression Factor		1.00						0.96			1.09	
Incremental Delay, d2		7.9						0.6			2.2	
Delay (s)		48.7						15.8			18.1	
Level of Service		D						B			B	
Approach Delay (s)		48.7			0.0			15.8			18.1	
Approach LOS		D			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1018: Ashland Ave. □ W Diversey Pkwy.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	184	733	75	144	480	68	0	602	79	0	995	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	10	10	9	11	11	11	11	11	11
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.85		1.00	0.89		1.00	0.66
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1535	1615	1183	1580	1647	1137		716	522		1413	934
Flt Permitted	0.10	1.00	1.00	0.11	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	158	1615	1183	175	1647	1137		716	522		1413	934
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	202	805	82	158	527	75	0	662	87	0	1093	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	202	805	82	158	527	75	0	662	87	0	1093	63
Confl. Peds. (#/hr)	44		31	31		44			20			76
Confl. Bikes (#/hr)			5			2			3			1
Heavy Vehicles (%)	4%	4%	3%	1%	2%	3%	0%	7%	10%	4%	1%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								92	92		16	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	51.0	43.0	43.0	43.0	38.0	38.0		71.0	71.0		71.0	71.0
Effective Green, g (s)	51.0	43.0	43.0	43.0	38.0	38.0		71.0	71.0		71.0	71.0
Actuated g/C Ratio	0.39	0.33	0.33	0.33	0.29	0.29		0.55	0.55		0.55	0.55
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	167	534	391	111	481	332		391	285		771	510
v/s Ratio Prot	c0.09	c0.50		c0.05	0.32			c0.93			0.77	
v/s Ratio Perm	0.38		0.07	0.41		0.07			0.17			0.07
v/c Ratio	1.21	1.51	0.21	1.42	1.10	0.23		1.69	0.31		1.42	0.12
Uniform Delay, d1	34.4	43.5	31.3	41.9	46.0	34.9		29.5	16.1		29.5	14.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.30	1.54		0.78	0.94
Incremental Delay, d2	137.1	238.0	1.2	234.8	69.6	1.6		312.9	0.2		195.0	0.5
Delay (s)	171.5	281.5	32.5	276.7	115.6	36.4		351.4	25.0		218.0	13.9
Level of Service	F	F	C	F	F	D		F	C		F	B
Approach Delay (s)		242.3			141.2			313.5			206.9	
Approach LOS		F			F			F			F	

Intersection Summary		
HCM 2000 Control Delay	225.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.63	F
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	114.4%	11.0
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1019: Ashland Ave. □ W Wrightwood Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	32	205	98	102	128	15	0	634	53	0	677	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.99			0.99			1.00	
Flt Protected		1.00			0.98			1.00			1.00	
Satd. Flow (prot)		1530			1555			1151			1527	
Flt Permitted		0.95			0.52			1.00			1.00	
Satd. Flow (perm)		1458			829			1151			1527	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	35	225	108	112	141	16	0	697	58	0	744	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	368	0	0	269	0	0	755	0	0	771	0
Confl. Peds. (#/hr)	12		2	2		12			4			3
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	0%	0%	1%	2%	0%	0%	6%	6%	4%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								38	38		0	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		40.0			40.0			82.0			82.0	
Effective Green, g (s)		40.0			40.0			82.0			82.0	
Actuated g/C Ratio		0.31			0.31			0.63			0.63	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		448			255			726			963	
v/s Ratio Prot								c0.66			0.50	
v/s Ratio Perm		0.25			c0.32							
v/c Ratio		0.82			1.05			1.04			0.80	
Uniform Delay, d1		41.7			45.0			24.0			17.9	
Progression Factor		1.00			1.00			0.54			0.34	
Incremental Delay, d2		15.5			71.5			39.4			0.7	
Delay (s)		57.2			116.5			52.5			6.8	
Level of Service		E			F			D			A	
Approach Delay (s)		57.2			116.5			52.5			6.8	
Approach LOS		E			F			D			A	

Intersection Summary

HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1023: Ashland Ave. □ W Fullerton Ave.

8/8/2013



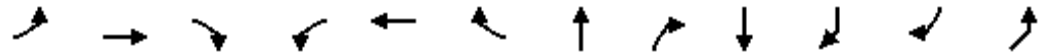
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗		↗	↗		↗	↗
Volume (vph)	124	630	7	164	476	15	0	506	54	0	596	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	9	10	9	11	11	11	11	11	11
Total Lost time (s)	2.0	5.0		2.0	5.0	5.0		5.0	5.0		5.0	2.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.94		1.00	0.92		1.00	0.88
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1475	3034		1505	1631	1288		1431	1115		1535	1157
Flt Permitted	0.19	1.00		0.21	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	295	3034		329	1631	1288		1431	1115		1535	1157
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	136	692	8	180	523	16	0	556	59	0	655	125
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	136	700	0	180	523	16	0	556	59	0	655	125
Confl. Peds. (#/hr)	20		24	24		20			39			38
Confl. Bikes (#/hr)			5			1			2			3
Heavy Vehicles (%)	8%	5%	0%	2%	3%	0%	0%	7%	6%	9%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								4	4		0	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm		NA	Perm		NA	pm+ov
Protected Phases	7	4		3	8			2 10			6	7
Permitted Phases	4			8		8			2 10			6
Actuated Green, G (s)	47.1	41.1		54.0	46.0	46.0		66.0	66.0		63.0	69.0
Effective Green, g (s)	47.1	41.1		54.0	46.0	46.0		64.0	64.0		63.0	69.0
Actuated g/C Ratio	0.36	0.32		0.42	0.35	0.35		0.49	0.49		0.48	0.53
Clearance Time (s)	2.0	5.0		2.0	5.0	5.0					5.0	2.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0					3.0	3.0
Lane Grp Cap (vph)	161	959		235	577	455		704	548		743	614
v/s Ratio Prot	c0.04	0.23		c0.06	c0.32			c0.39			c0.43	0.01
v/s Ratio Perm	0.27			0.25		0.01			0.05			0.10
v/c Ratio	0.84	0.73		0.77	0.91	0.04		0.79	0.11		0.88	0.20
Uniform Delay, d1	37.8	39.5		27.4	40.0	27.5		27.4	17.7		30.1	16.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.17	0.20		1.05	1.11
Incremental Delay, d2	31.3	4.9		13.8	20.4	0.1		4.3	0.2		8.4	0.1
Delay (s)	69.0	44.4		41.2	60.3	27.6		9.0	3.8		40.1	18.0
Level of Service	E	D		D	E	C		A	A		D	B
Approach Delay (s)		48.4			54.8			8.5			36.6	
Approach LOS		D			D			A			D	

Intersection Summary

HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1024: Medill Ave. □ Ashland Ave. □ N Clybourn Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL2	WBT	WBR	NBT	NBR	SBT	SBR	SBR2	NEL
Lane Configurations		↑	↔		↔		↑		↑			↔
Volume (vph)	4	615	176	18	209	46	542	32	731	11	1	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	11	11	11	11	11	11	11	11	11	11	16
Total Lost time (s)		5.0	5.0		5.0		5.0		5.0			
Lane Util. Factor		1.00	1.00		0.95		1.00		1.00			
Frbp, ped/bikes		1.00	0.96		1.00		1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00		1.00		1.00			
Frt		1.00	0.85		0.97		0.99		1.00			
Flt Protected		1.00	1.00		1.00		1.00		1.00			
Satd. Flow (prot)		1739	1417		3046		1425		1481			
Flt Permitted		1.00	1.00		0.79		1.00		1.00			
Satd. Flow (perm)		1737	1417		2408		1425		1481			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.92
Adj. Flow (vph)	4	676	193	20	230	51	596	35	803	12	1	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	680	193	0	301	0	631	0	816	0	0	0
Confl. Peds. (#/hr)	2		14				2		4			
Heavy Vehicles (%)	0%	0%	0%	0%	5%	7%	9%	6%	2%	0%	0%	2%
Parking (#/hr)							0		6			
Turn Type	Perm	NA	Perm	Perm	NA		NA		NA			
Protected Phases		4			8		2		6			10
Permitted Phases	4		4	8								
Actuated Green, G (s)		58.0	58.0		58.0		62.0		62.0			
Effective Green, g (s)		58.0	58.0		58.0		62.0		62.0			
Actuated g/C Ratio		0.45	0.45		0.45		0.48		0.48			
Clearance Time (s)		5.0	5.0		5.0		5.0		5.0			
Vehicle Extension (s)		3.0	3.0		3.0		3.0		3.0			
Lane Grp Cap (vph)		774	632		1074		679		706			
v/s Ratio Prot							0.44		c0.55			
v/s Ratio Perm		c0.39	0.14		0.13							
v/c Ratio		0.88	0.31		0.28		0.93		1.16			
Uniform Delay, d1		32.8	23.1		22.8		31.9		34.0			
Progression Factor		1.00	1.00		1.00		1.00		0.66			
Incremental Delay, d2		13.5	1.2		0.7		21.0		78.7			
Delay (s)		46.3	24.3		23.4		52.9		101.1			
Level of Service		D	C		C		D		F			
Approach Delay (s)		41.4			23.4		52.9		101.1			0.0
Approach LOS		D			C		D		F			A
Intersection Summary												
HCM 2000 Control Delay			60.7				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		15.0			
Intersection Capacity Utilization			122.2%				ICU Level of Service		H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1025: Ashland Ave. □ W Webster Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖↗			↖			↗	
Volume (vph)	48	226	3	152	263	14	0	551	86	0	671	104
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		0.95			1.00			1.00	
Frbp, ped/bikes		1.00	0.97		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		1.00			0.98			0.98	
Flt Protected		0.99	1.00		0.98			1.00			1.00	
Satd. Flow (prot)		1664	1387		3114			1363			1481	
Flt Permitted		0.79	1.00		0.61			1.00			1.00	
Satd. Flow (perm)		1322	1387		1948			1363			1481	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	53	248	3	167	289	15	0	605	95	0	737	114
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	301	3	0	471	0	0	700	0	0	851	0
Confl. Peds. (#/hr)	4		4	4		4			2			7
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	14%	2%	10%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								0	0		0	
Turn Type	Perm	NA	Perm	Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		28.0	28.0		28.0			64.0			64.0	
Effective Green, g (s)		28.0	28.0		28.0			64.0			64.0	
Actuated g/C Ratio		0.28	0.28		0.28			0.64			0.64	
Clearance Time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Grp Cap (vph)		370	388		545			872			947	
v/s Ratio Prot								0.51			c0.57	
v/s Ratio Perm		0.23	0.00		c0.24							
v/c Ratio		0.81	0.01		0.99dl			0.80			0.90	
Uniform Delay, d1		33.6	26.0		34.2			13.3			15.3	
Progression Factor		1.00	1.00		1.00			0.43			1.00	
Incremental Delay, d2		17.6	0.0		16.5			4.8			13.1	
Delay (s)		51.1	26.0		50.7			10.6			28.3	
Level of Service		D	C		D			B			C	
Approach Delay (s)		50.9			50.7			10.6			28.3	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1026: Ashland Ave. □ N Elston Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗		↑	↗		↖			↗	
Volume (vph)	0	581	59	4	118	80	0	567	1	0	824	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	16	16	12	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0	3.0		4.0			3.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frbp, ped/bikes		1.00	0.98		1.00	0.97		1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		1.00			1.00	
Flt Protected		1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)		1647	1323		1943	1438		1506			1550	
Flt Permitted		1.00	1.00		0.86	1.00		1.00			1.00	
Satd. Flow (perm)		1647	1323		1679	1438		1506			1550	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Adj. Flow (vph)	0	638	65	4	130	88	0	623	1	0	905	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	638	65	0	134	88	0	624	0	0	908	0
Confl. Peds. (#/hr)	9		10	10		9						
Heavy Vehicles (%)	0%	2%	2%	0%	5%	3%	0%	4%	0%	5%	1%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	custom		NA			NA	
Protected Phases		4			8	1		2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)		37.0	37.0		37.0	41.0		48.0			56.0	
Effective Green, g (s)		37.0	37.0		37.0	41.0		48.0			56.0	
Actuated g/C Ratio		0.37	0.37		0.37	0.41		0.48			0.56	
Clearance Time (s)		4.0	4.0		4.0	3.0		4.0			3.0	
Lane Grp Cap (vph)		609	489		621	589		722			868	
v/s Ratio Prot		c0.39				0.01		0.41			c0.59	
v/s Ratio Perm			0.05		0.08	0.06						
v/c Ratio		1.05	0.13		0.22	0.15		0.86			1.05	
Uniform Delay, d1		31.5	20.9		21.6	18.5		23.1			22.0	
Progression Factor		1.00	1.00		1.00	1.00		0.56			1.21	
Incremental Delay, d2		49.5	0.6		0.8	0.5		7.7			33.5	
Delay (s)		81.0	21.4		22.4	19.1		20.6			60.0	
Level of Service		F	C		C	B		C			E	
Approach Delay (s)		75.5			21.1			20.6			60.0	
Approach LOS		E			C			C			E	

Intersection Summary

HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1027: Ashland Ave. □ W Armitage Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	462	408	57	7	197	0	85	261	10	0	492	239
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	10	10	16	16	16	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0			5.0		2.0	4.0			4.0	3.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.98
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.98			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1542	1555			1933		1545	1332			1689	1265
Flt Permitted	0.24	1.00			0.97		0.19	1.00			1.00	1.00
Satd. Flow (perm)	389	1555			1880		317	1332			1689	1265
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	508	448	63	8	216	0	93	287	11	0	541	263
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	508	511	0	0	224	0	93	298	0	0	541	263
Confl. Peds. (#/hr)	11		2	2		11	7		3			7
Heavy Vehicles (%)	7%	6%	4%	14%	5%	0%	7%	16%	0%	11%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	0	0
Parking (#/hr)								0				0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA			NA	pm+ov
Protected Phases	7	4			8		5	2			6	7
Permitted Phases	4			8			2					6
Actuated Green, G (s)	44.7	44.7			13.7		46.3	46.3			39.5	67.5
Effective Green, g (s)	44.7	44.7			13.7		46.3	46.3			39.5	67.5
Actuated g/C Ratio	0.45	0.45			0.14		0.46	0.46			0.40	0.68
Clearance Time (s)	3.0	5.0			5.0		2.0	4.0			4.0	3.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	496	695			257		205	616			667	853
v/s Ratio Prot	c0.29	0.33					0.02	c0.22			c0.32	0.09
v/s Ratio Perm	c0.17				0.12		0.19					0.12
v/c Ratio	1.02	0.74			0.87		0.45	0.48			0.81	0.31
Uniform Delay, d1	26.7	22.8			42.3		18.6	18.6			26.9	6.7
Progression Factor	1.00	1.00			1.00		1.16	1.04			1.40	1.02
Incremental Delay, d2	46.7	4.0			26.0		0.1	0.2			3.0	0.1
Delay (s)	73.4	26.8			68.3		21.7	19.6			40.6	6.9
Level of Service	E	C			E		C	B			D	A
Approach Delay (s)		50.0			68.3			20.1			29.5	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1029: Ashland Ave. □ W Cortland St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↔			↑			↑	
Volume (vph)	0	279	20	100	122	4	0	497	91	0	440	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frbp, ped/bikes		1.00	0.90		0.99			0.97			0.98	
Flpb, ped/bikes		1.00	1.00		0.98			1.00			1.00	
Frt		1.00	0.85		1.00			0.98			0.98	
Flt Protected		1.00	1.00		0.98			1.00			1.00	
Satd. Flow (prot)		1667	1308		1581			898			1468	
Flt Permitted		1.00	1.00		0.52			1.00			1.00	
Satd. Flow (perm)		1667	1308		838			898			1468	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	0	307	22	110	134	4	0	546	100	0	484	101
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	307	22	0	248	0	0	646	0	0	585	0
Confl. Peds. (#/hr)	159		27	27		159			52			28
Heavy Vehicles (%)	0%	8%	5%	6%	11%	0%	0%	8%	3%	50%	3%	0%
Parking (#/hr)								64				0
Turn Type		NA	Perm	pm+pt	NA			NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases			4	8								
Actuated Green, G (s)		31.0	31.0		31.0			60.0			60.0	
Effective Green, g (s)		31.0	31.0		31.0			60.0			60.0	
Actuated g/C Ratio		0.31	0.31		0.31			0.60			0.60	
Clearance Time (s)		5.0	5.0		5.0			4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		516	405		259			538			880	
v/s Ratio Prot		0.18						c0.72			0.40	
v/s Ratio Perm			0.02		c0.30							
v/c Ratio		0.59	0.05		0.96			1.20			0.66	
Uniform Delay, d1		29.2	24.2		33.9			20.0			13.3	
Progression Factor		1.00	1.00		1.00			0.58			0.51	
Incremental Delay, d2		5.0	0.3		43.8			105.0			2.7	
Delay (s)		34.2	24.5		77.6			116.5			9.5	
Level of Service		C	C		E			F			A	
Approach Delay (s)		33.5			77.6			116.5			9.5	
Approach LOS		C			E			F			A	

Intersection Summary

HCM 2000 Control Delay	61.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1030: Ashland Ave. □ W Wabansia Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	34	4	130	24	10	18	0	483	6	0	401	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.95			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.90			0.95			1.00			1.00	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1397			1103			1228			1513	
Flt Permitted		0.93			0.83			1.00			1.00	
Satd. Flow (perm)		1317			940			1228			1513	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Adj. Flow (vph)	37	4	143	26	11	20	0	531	7	0	441	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	184	0	0	57	0	0	538	0	0	450	0
Confl. Peds. (#/hr)	1		20	20			1		4			1
Heavy Vehicles (%)	0%	0%	1%	42%	0%	56%	8%	9%	0%	0%	3%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								26	26		0	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		19.8			19.8			72.2			72.2	
Effective Green, g (s)		19.8			19.8			72.2			72.2	
Actuated g/C Ratio		0.20			0.20			0.72			0.72	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		260			186			886			1092	
v/s Ratio Prot								c0.44			0.30	
v/s Ratio Perm		c0.14			0.06							
v/c Ratio		0.71			0.31			0.61			0.41	
Uniform Delay, d1		37.4			34.2			6.9			5.5	
Progression Factor		1.00			1.00			0.16			1.14	
Incremental Delay, d2		10.6			2.0			1.5			0.8	
Delay (s)		48.0			36.2			2.6			7.1	
Level of Service		D			D			A			A	
Approach Delay (s)		48.0			36.2			2.6			7.1	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1033: Ashland Ave. □ W North Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘			↕	↗		↕	↗
Volume (vph)	84	684	33	92	455	19	0	521	88	0	516	28
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	11	11	11	11	11
Total Lost time (s)	3.0	4.0		3.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.97		1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1338	2730		1508	3002			1129	971		1166	910
Flt Permitted	0.32	1.00		0.17	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	452	2730		266	3002			1129	971		1166	910
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	92	752	36	101	500	21	0	573	97	0	567	31
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	92	788	0	101	521	0	0	573	97	0	567	31
Confl. Peds. (#/hr)			13	13					10			27
Heavy Vehicles (%)	15%	12%	6%	2%	2%	0%	2%	14%	8%	0%	3%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								32	32		42	42
Turn Type	pm+pt	NA		pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	37.4	31.0		35.8	30.2			52.4	52.4		52.4	52.4
Effective Green, g (s)	37.4	31.0		35.8	30.2			52.4	52.4		52.4	52.4
Actuated g/C Ratio	0.37	0.31		0.36	0.30			0.52	0.52		0.52	0.52
Clearance Time (s)	3.0	4.0		3.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	225	846		164	906			591	508		610	476
v/s Ratio Prot	c0.03	c0.29		c0.03	0.17			c0.51			0.49	
v/s Ratio Perm	0.13			0.18					0.10			0.03
v/c Ratio	0.41	0.93		0.62	0.58			0.97	0.19		0.93	0.07
Uniform Delay, d1	21.5	33.5		23.6	29.5			23.0	12.6		22.1	11.7
Progression Factor	1.00	1.00		1.00	1.00			1.28	1.33		0.60	0.59
Incremental Delay, d2	1.2	18.2		6.7	2.7			25.8	0.6		21.9	0.2
Delay (s)	22.8	51.7		30.3	32.1			55.4	17.3		35.2	7.2
Level of Service	C	D		C	C			E	B		D	A
Approach Delay (s)		48.6			31.8			49.9			33.7	
Approach LOS		D			C			D			C	

Intersection Summary

HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1039: Ashland Ave. □ W Blackhawk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	49	72	11	50	24	44	0	543	30	0	579	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	11	11	11	11	11	11	11	11	11
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.97			1.00			1.00	
Flpb, ped/bikes		0.98			0.99			1.00			1.00	
Frt		0.99			0.95			0.99			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1928			1549			1103			1386	
Flt Permitted		0.87			0.85			1.00			1.00	
Satd. Flow (perm)		1718			1340			1103			1386	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	54	79	12	55	26	48	0	597	33	0	636	12
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	145	0	0	129	0	0	630	0	0	648	0
Confl. Peds. (#/hr)	24		9	9		24			9			19
Heavy Vehicles (%)	0%	0%	9%	0%	0%	2%	4%	5%	0%	1%	5%	9%
Parking (#/hr)								46				12
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			70.0			70.0	
Effective Green, g (s)		24.0			24.0			70.0			70.0	
Actuated g/C Ratio		0.24			0.24			0.70			0.70	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		412			321			772			970	
v/s Ratio Prot								c0.57			0.47	
v/s Ratio Perm		0.08			c0.10							
v/c Ratio		0.35			0.40			0.82			0.67	
Uniform Delay, d1		31.5			32.0			10.5			8.5	
Progression Factor		1.00			1.00			0.41			0.59	
Incremental Delay, d2		2.4			3.7			8.5			2.2	
Delay (s)		33.9			35.7			12.8			7.2	
Level of Service		C			D			B			A	
Approach Delay (s)		33.9			35.7			12.8			7.2	
Approach LOS		C			D			B			A	

Intersection Summary

HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1042: Ashland Ave. □ N Milwaukee Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↖			↗	
Volume (vph)	13	372	83	0	176	51	0	423	13	0	594	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	11	11	11	11	11	8	11	11	11
Total Lost time (s)	5.0	5.0			5.0	3.0		5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	0.99			1.00	0.93		1.00			1.00	
Flpb, ped/bikes	0.95	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.97			1.00	0.85		1.00			1.00	
Flt Protected	0.95	1.00			1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1522	1601			1642	1252		1593			1520	
Flt Permitted	0.64	1.00			1.00	1.00		1.00			1.00	
Satd. Flow (perm)	1019	1601			1642	1252		1593			1520	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.90	0.91	0.91	0.90	0.91	0.91
Adj. Flow (vph)	14	409	91	0	193	56	0	465	14	0	653	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	14	500	0	0	193	56	0	479	0	0	653	0
Confl. Peds. (#/hr)	40		24			40			4			11
Heavy Vehicles (%)	0%	5%	5%	0%	6%	10%	8%	9%	0%	5%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA			NA	custom		NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4					3 8						
Actuated Green, G (s)	36.0	36.0			40.0	40.0		50.0			50.0	
Effective Green, g (s)	36.0	36.0			40.0	40.0		50.0			50.0	
Actuated g/C Ratio	0.36	0.36			0.40	0.40		0.50			0.50	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	366	576			656	500		796			760	
v/s Ratio Prot		c0.31			c0.12			0.30			c0.43	
v/s Ratio Perm	0.01					0.04						
v/c Ratio	0.04	0.87			0.29	0.11		0.60			0.86	
Uniform Delay, d1	20.8	29.8			20.4	18.8		17.9			21.9	
Progression Factor	1.00	1.00			1.00	1.00		0.57			1.14	
Incremental Delay, d2	0.2	16.2			1.1	0.5		2.2			10.2	
Delay (s)	21.0	45.9			21.5	19.3		12.4			35.2	
Level of Service	C	D			C	B		B			D	
Approach Delay (s)		45.3			21.0			12.4			35.2	
Approach LOS		D			C			B			D	

Intersection Summary

HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1043: Ashland Ave. □ W Division St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘	↘	↑↑	↘		↑	↘		↑	↘
Volume (vph)	131	706	54	141	442	42	0	525	141	0	454	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.83	1.00	1.00	0.79		1.00	0.82		1.00	0.87
Flpb, ped/bikes	0.90	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1459	3179	1200	1631	3160	1124		1395	1149		1550	1147
Flt Permitted	0.48	1.00	1.00	0.15	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	729	3179	1200	253	3160	1124		1395	1149		1550	1147
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.93	0.91	0.91	0.93	0.91	0.91
Adj. Flow (vph)	144	776	59	155	486	46	0	577	155	0	499	124
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	776	59	155	486	46	0	577	155	0	499	124
Confl. Peds. (#/hr)	102		77	77		102			145			102
Confl. Bikes (#/hr)			7			1			1			1
Heavy Vehicles (%)	2%	4%	2%	1%	1%	0%	7%	6%	6%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								10			0	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	29.0	29.0	29.0	39.0	39.0	39.0		51.0	51.0		51.0	51.0
Effective Green, g (s)	29.0	29.0	29.0	39.0	39.0	39.0		51.0	51.0		51.0	51.0
Actuated g/C Ratio	0.29	0.29	0.29	0.39	0.39	0.39		0.51	0.51		0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	211	921	348	195	1232	438		711	585		790	584
v/s Ratio Prot		0.24		c0.06	0.15			c0.41			0.32	
v/s Ratio Perm	0.20		0.05	c0.25		0.04			0.13			0.11
v/c Ratio	0.68	0.84	0.17	0.79	0.39	0.11		0.81	0.26		0.63	0.21
Uniform Delay, d1	31.4	33.4	26.5	22.9	22.0	19.4		20.5	13.9		17.7	13.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.99	0.97		0.23	0.27
Incremental Delay, d2	16.4	9.3	1.1	27.5	0.9	0.5		8.3	0.9		1.9	0.4
Delay (s)	47.9	42.6	27.6	50.5	22.9	19.9		28.5	14.3		5.9	4.1
Level of Service	D	D	C	D	C	B		C	B		A	A
Approach Delay (s)		42.5			28.9			25.5			5.6	
Approach LOS		D			C			C			A	

Intersection Summary

HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1049: Ashland Ave. □ W Augusta Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	476	52	50	247	29	0	402	118	0	494	83
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	9	10	9	11	11	11	11	11	11
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.90		0.98			0.99	
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1524	1740	1400	1480	1647	1083		1205			1228	
Flt Permitted	0.43	1.00	1.00	0.12	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	695	1740	1400	190	1647	1083		1205			1228	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	187	523	57	55	271	32	0	442	130	0	543	91
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	187	523	57	55	271	32	0	572	0	0	634	0
Confl. Peds. (#/hr)	34		6	6		34			20			6
Heavy Vehicles (%)	0%	0%	2%	4%	2%	14%	0%	12%	2%	2%	4%	1%
Parking (#/hr)								20			30	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	33.0	33.0	33.0	33.0	33.0	33.0		61.0			61.0	
Effective Green, g (s)	33.0	33.0	33.0	33.0	33.0	33.0		61.0			61.0	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33		0.61			0.61	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	229	574	462	62	543	357		735			749	
v/s Ratio Prot		c0.30			0.16			0.47			c0.52	
v/s Ratio Perm	0.27		0.04	0.29		0.03						
v/c Ratio	0.82	0.91	0.12	0.89	0.50	0.09		0.78			0.85	
Uniform Delay, d1	30.7	32.1	23.4	31.7	26.9	23.1		14.5			15.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			0.79	
Incremental Delay, d2	19.7	18.7	0.1	74.6	0.7	0.1		8.0			9.9	
Delay (s)	50.4	50.8	23.5	106.4	27.6	23.2		22.4			22.2	
Level of Service	D	D	C	F	C	C		C			C	
Approach Delay (s)		48.7			39.3			22.4			22.2	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1056: Ashland Ave. □ W Chicago Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘			↕	↗		↕	↗
Volume (vph)	137	584	67	43	453	19	0	403	71	0	551	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.96		1.00	0.94
Flpb, ped/bikes	1.00	1.00		0.97	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1588	3127		1598	3221			1389	1380		1550	1395
Flt Permitted	0.39	1.00		0.27	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	657	3127		448	3221			1389	1380		1550	1395
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	151	642	74	47	498	21	0	443	78	0	605	112
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	151	716	0	47	519	0	0	443	78	0	605	112
Confl. Peds. (#/hr)	2		103	103		2			37			61
Heavy Vehicles (%)	4%	3%	1%	0%	2%	0%	0%	4%	3%	1%	1%	0%
Parking (#/hr)								14			0	
Turn Type	Perm	NA		Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	23.5	23.5		23.5	23.5			33.5	33.5		33.5	33.5
Effective Green, g (s)	23.5	23.5		23.5	23.5			33.5	33.5		33.5	33.5
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.52	0.52		0.52	0.52
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	237	1130		161	1164			715	711		798	718
v/s Ratio Prot		0.23			0.16			0.32			c0.39	
v/s Ratio Perm	c0.23			0.10					0.06			0.08
v/c Ratio	0.64	0.63		0.29	0.45			0.62	0.11		0.76	0.16
Uniform Delay, d1	17.2	17.2		14.8	15.8			11.2	8.1		12.5	8.3
Progression Factor	1.00	1.00		1.00	1.00			0.80	0.62		1.00	1.00
Incremental Delay, d2	5.5	1.2		1.0	0.3			3.1	0.2		6.7	0.5
Delay (s)	22.7	18.4		15.8	16.1			12.0	5.3		19.2	8.8
Level of Service	C	B		B	B			B	A		B	A
Approach Delay (s)		19.1			16.0			11.0			17.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1062: Ashland Ave. □ W Erie St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↔			↔	
Volume (vph)	43	56	26	12	17	19	0	517	9	0	579	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.98			1.00			1.00	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.97			0.95			1.00			1.00	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1539			1471			1379			1427	
Flt Permitted		0.89			0.93			1.00			1.00	
Satd. Flow (perm)		1394			1382			1379			1427	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	47	62	29	13	19	21	0	568	10	0	636	8
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	138	0	0	53	0	0	578	0	0	644	0
Confl. Peds. (#/hr)	15		12	12		15			10			3
Heavy Vehicles (%)	2%	4%	0%	0%	0%	11%	0%	7%	0%	2%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								10	10		14	14
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.0			18.0			39.0			39.0	
Effective Green, g (s)		18.0			18.0			39.0			39.0	
Actuated g/C Ratio		0.28			0.28			0.60			0.60	
Clearance Time (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		386			382			827			856	
v/s Ratio Prot								0.42			c0.45	
v/s Ratio Perm		c0.10			0.04							
v/c Ratio		0.36			0.14			0.70			0.75	
Uniform Delay, d1		18.9			17.7			9.0			9.5	
Progression Factor		1.00			1.00			0.74			0.79	
Incremental Delay, d2		2.6			0.8			3.4			5.2	
Delay (s)		21.4			18.4			10.1			12.7	
Level of Service		C			B			B			B	
Approach Delay (s)		21.4			18.4			10.1			12.7	
Approach LOS		C			B			B			B	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1066: Ashland Ave. □ W Grand Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕		↘	↕			↕	↘		↕	↘
Volume (vph)	98	837	179	64	423	35	0	488	69	0	475	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00			1.00	0.97		1.00	0.91
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.97		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1510	2876		1457	2915			1325	1337		1535	1179
Flt Permitted	0.40	1.00		0.18	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	643	2876		281	2915			1325	1337		1535	1179
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	108	920	197	70	465	38	0	536	76	0	522	52
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	108	1117	0	70	503	0	0	536	76	0	522	52
Confl. Peds. (#/hr)	41		61	61		41			16			58
Heavy Vehicles (%)	5%	6%	5%	8%	8%	6%	10%	9%	7%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								14			0	0
Turn Type	pm+pt	NA		Perm	NA			NA	Perm		NA	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	30.6	29.6		21.8	21.8			27.4	27.4		27.4	27.4
Effective Green, g (s)	30.6	29.6		21.8	21.8			27.4	27.4		27.4	27.4
Actuated g/C Ratio	0.47	0.46		0.34	0.34			0.42	0.42		0.42	0.42
Clearance Time (s)	3.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	366	1309		94	977			558	563		647	496
v/s Ratio Prot	0.02	c0.39			0.17			c0.40			0.34	
v/s Ratio Perm	0.12			0.25					0.06			0.04
v/c Ratio	0.30	0.85		0.74	0.51			0.96	0.13		0.81	0.10
Uniform Delay, d1	12.9	15.8		19.1	17.4			18.3	11.5		16.5	11.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.82	0.57
Incremental Delay, d2	0.5	7.2		41.1	1.9			29.5	0.5		7.7	0.3
Delay (s)	13.3	23.0		60.3	19.3			47.8	12.0		21.1	6.8
Level of Service	B	C		E	B			D	B		C	A
Approach Delay (s)		22.1			24.3			43.3			19.8	
Approach LOS		C			C			D			B	

Intersection Summary

HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1073: Ashland Ave. □ W Fulton St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	48	29	0	466	498	77
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11
Total Lost time (s)	3.0			3.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	0.95			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.95			1.00	0.98	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1231			1450	1468	
Flt Permitted	0.97			1.00	1.00	
Satd. Flow (perm)	1231			1450	1468	
Peak-hour factor, PHF	0.91	0.91	0.97	0.91	0.91	0.91
Adj. Flow (vph)	53	32	0	512	547	85
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	85	0	0	512	632	0
Confl. Peds. (#/hr)	23	12				
Heavy Vehicles (%)	29%	14%	21%	8%	5%	3%
Parking (#/hr)				0	0	
Turn Type	NA			NA	NA	
Protected Phases	4			2 10	6	
Permitted Phases						
Actuated Green, G (s)	16.0			78.0	70.0	
Effective Green, g (s)	16.0			78.0	70.0	
Actuated g/C Ratio	0.16			0.78	0.70	
Clearance Time (s)	3.0				3.0	
Lane Grp Cap (vph)	196			1131	1027	
v/s Ratio Prot	c0.07			c0.35	c0.43	
v/s Ratio Perm						
v/c Ratio	0.43			0.45	0.62	
Uniform Delay, d1	37.9			3.7	7.9	
Progression Factor	1.00			0.09	1.00	
Incremental Delay, d2	6.8			1.1	2.8	
Delay (s)	44.8			1.4	10.7	
Level of Service	D			A	B	
Approach Delay (s)	44.8			1.4	10.7	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1074: Ashland Ave. □ W Fulton St. (East)

8/8/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Volume (vph)	10	15	466	67	0	510
Ideal Flow (vphp)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	11	11	11	11
Total Lost time (s)	3.0		3.0			3.0
Lane Util. Factor	1.00		1.00			1.00
Frbp, ped/bikes	0.85		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		0.98			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1043		1429			1425
Flt Permitted	0.98		1.00			1.00
Satd. Flow (perm)	1043		1429			1425
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.99	0.91
Adj. Flow (vph)	11	16	512	74	0	560
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	27	0	586	0	0	560
Confl. Peds. (#/hr)	12	23				
Heavy Vehicles (%)	30%	20%	8%	6%	0%	5%
Parking (#/hr)			0			8
Turn Type	NA		NA			NA
Protected Phases	8		2			6 14
Permitted Phases						
Actuated Green, G (s)	16.0		70.0			78.0
Effective Green, g (s)	16.0		70.0			78.0
Actuated g/C Ratio	0.16		0.70			0.78
Clearance Time (s)	3.0		3.0			
Lane Grp Cap (vph)	166		1000			1111
v/s Ratio Prot	c0.03		c0.41			c0.39
v/s Ratio Perm						
v/c Ratio	0.16		0.59			0.50
Uniform Delay, d1	36.2		7.6			4.0
Progression Factor	1.00		0.68			0.16
Incremental Delay, d2	2.1		1.5			1.3
Delay (s)	38.3		6.7			1.9
Level of Service	D		A			A
Approach Delay (s)	38.3		6.7			1.9
Approach LOS	D		A			A

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1077: Ashland Ave. □ W Lake St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Volume (vph)	37	280	37	6	158	42	0	490	33	0	513	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.99			0.99			1.00	0.69
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		0.99			0.97			0.99			1.00	0.85
Flt Protected		0.99			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1625			1602			1131			1689	915
Flt Permitted		0.95			0.99			1.00			1.00	1.00
Satd. Flow (perm)		1553			1584			1131			1689	915
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.93	0.91	0.91	0.93	0.91	0.91
Adj. Flow (vph)	41	308	41	7	174	46	0	538	36	0	564	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	390	0	0	227	0	0	574	0	0	564	16
Confl. Peds. (#/hr)	10		36	36		10			34			77
Confl. Bikes (#/hr)			3						2			6
Heavy Vehicles (%)	14%	7%	3%	67%	6%	7%	0%	9%	6%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								36	36			0
Turn Type	Perm	NA		Perm	NA			NA			NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8								6
Actuated Green, G (s)		30.0			30.0			62.0			62.0	62.0
Effective Green, g (s)		30.0			30.0			62.0			62.0	62.0
Actuated g/C Ratio		0.30			0.30			0.62			0.62	0.62
Clearance Time (s)		4.0			4.0			4.0			4.0	4.0
Lane Grp Cap (vph)		465			475			701			1047	567
v/s Ratio Prot								c0.51			0.33	
v/s Ratio Perm		c0.25			0.14							0.02
v/c Ratio		0.84			0.48			0.82			0.54	0.03
Uniform Delay, d1		32.7			28.6			14.7			10.8	7.3
Progression Factor		1.00			1.00			0.46			0.47	0.62
Incremental Delay, d2		16.4			3.4			9.8			1.8	0.1
Delay (s)		49.2			32.0			16.5			6.9	4.7
Level of Service		D			C			B			A	A
Approach Delay (s)		49.2			32.0			16.5			6.9	
Approach LOS		D			C			B			A	

Intersection Summary

HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1079: Ashland Ave. □ W Washington Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↑↑	↗		↑↑			↑↗		
Volume (vph)	0	0	0	8	139	10	0	640	0	0	558	106	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	10	10	10	11	11	11	11	11	11	
Total Lost time (s)				4.0	4.0	4.0		4.0			4.0		
Lane Util. Factor				1.00	0.95	1.00		0.95			0.95		
Frbp, ped/bikes				1.00	1.00	0.96		1.00			0.98		
Flpb, ped/bikes				0.99	1.00	1.00		1.00			1.00		
Frt				1.00	1.00	0.85		1.00			0.98		
Flt Protected				0.95	1.00	1.00		1.00			1.00		
Satd. Flow (prot)				1588	3192	1242		2935			2704		
Flt Permitted				0.95	1.00	1.00		1.00			1.00		
Satd. Flow (perm)				1588	3192	1242		2935			2704		
Peak-hour factor, PHF	0.91	0.97	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91	
Adj. Flow (vph)	0	0	0	9	153	11	0	703	0	0	613	116	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	9	153	11	0	703	0	0	729	0	
Confl. Peds. (#/hr)			4	4		23			27			56	
Confl. Bikes (#/hr)			1			2						3	
Heavy Vehicles (%)	9%	0%	0%	0%	0%	10%	3%	7%	0%	0%	4%	2%	
Parking (#/hr)								0			26		
Turn Type				Perm	NA	Perm		NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8		8							
Actuated Green, G (s)				27.0	27.0	27.0		65.0			65.0		
Effective Green, g (s)				27.0	27.0	27.0		65.0			65.0		
Actuated g/C Ratio				0.27	0.27	0.27		0.65			0.65		
Clearance Time (s)				4.0	4.0	4.0		4.0			4.0		
Lane Grp Cap (vph)				428	861	335		1907			1757		
v/s Ratio Prot					c0.05			0.24			c0.27		
v/s Ratio Perm				0.01		0.01							
v/c Ratio				0.02	0.18	0.03		0.37			0.41		
Uniform Delay, d1				26.8	28.0	26.9		8.1			8.4		
Progression Factor				1.00	1.00	1.00		0.44			0.70		
Incremental Delay, d2				0.1	0.5	0.2		0.5			0.7		
Delay (s)				26.9	28.4	27.1		4.1			6.5		
Level of Service				C	C	C		A			A		
Approach Delay (s)		0.0			28.3			4.1			6.5		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			7.8		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.35										
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			46.4%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 1080: Ashland Ave. □ W Warren Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Volume (vph)	108	278	42	0	0	0	0	530	65	0	464	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						0.95			0.95	
Frbp, ped/bikes		1.00						0.99			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.99						0.98			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		2873						2591			2589	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		2873						2591			2589	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.96	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	119	305	46	0	0	0	0	582	71	0	510	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	470	0	0	0	0	0	653	0	0	510	0
Confl. Peds. (#/hr)	3		5				3			29		32
Confl. Bikes (#/hr)			4							2		2
Heavy Vehicles (%)	7%	3%	2%	0%	0%	0%	0%	7%	3%	3%	4%	0%
Parking (#/hr)								0			18	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		37.0						55.0			55.0	
Effective Green, g (s)		37.0						55.0			55.0	
Actuated g/C Ratio		0.37						0.55			0.55	
Clearance Time (s)		4.0						4.0			4.0	
Lane Grp Cap (vph)		1063						1425			1423	
v/s Ratio Prot								c0.25			0.20	
v/s Ratio Perm		0.16										
v/c Ratio		0.44						0.46			0.36	
Uniform Delay, d1		23.7						13.5			12.6	
Progression Factor		1.00						0.71			0.51	
Incremental Delay, d2		1.3						1.0			0.7	
Delay (s)		25.1						10.6			7.1	
Level of Service		C						B			A	
Approach Delay (s)		25.1			0.0			10.6			7.1	
Approach LOS		C			A			B			A	

Intersection Summary

HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1082: Ashland Ave. □ W Madison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↕		↖	↕			↕			↕	
Volume (vph)	48	324	39	20	218	73	0	407	3	0	556	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		2.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.98	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.96			1.00			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1513	2864		1569	2800			2906			3023	
Flt Permitted	0.53	1.00		0.46	1.00			1.00			1.00	
Satd. Flow (perm)	838	2864		762	2800			2906			3023	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.99	0.91	0.91	0.99	0.91	0.91
Adj. Flow (vph)	53	356	43	22	240	80	0	447	3	0	611	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	53	399	0	22	320	0	0	450	0	0	635	0
Confl. Peds. (#/hr)	16		23	23		16			17			25
Confl. Bikes (#/hr)			3			2						2
Heavy Vehicles (%)	4%	9%	10%	0%	10%	5%	17%	8%	0%	5%	3%	5%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		custom	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			3	8							
Actuated Green, G (s)	33.0	33.0		45.0	43.0			49.0			49.0	
Effective Green, g (s)	33.0	33.0		45.0	43.0			49.0			49.0	
Actuated g/C Ratio	0.33	0.33		0.45	0.43			0.49			0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	276	945		342	1204			1423			1481	
v/s Ratio Prot		c0.14			c0.11			0.15			c0.21	
v/s Ratio Perm	0.06			0.03								
v/c Ratio	0.19	0.42		0.06	0.27			0.32			0.43	
Uniform Delay, d1	24.0	26.1		15.6	18.3			15.4			16.5	
Progression Factor	1.00	1.00		1.00	1.00			0.50			0.43	
Incremental Delay, d2	1.5	1.4		0.4	0.5			0.4			0.9	
Delay (s)	25.5	27.5		15.9	18.9			8.1			8.0	
Level of Service	C	C		B	B			A			A	
Approach Delay (s)		27.2			18.7			8.1			8.0	
Approach LOS		C			B			A			A	

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1083: Ashland Ave. □ W Ogden Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↗↘		↗	↗↘			↗↘			↗↘	
Volume (vph)	160	558	0	250	568	1	0	320	185	0	405	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		3.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1628	3288		1588	3143			2835			2897	
Flt Permitted	0.38	1.00		0.36	1.00			1.00			1.00	
Satd. Flow (perm)	646	3288		598	3143			2835			2897	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.99	0.91	0.91	0.99	0.91	0.91
Adj. Flow (vph)	176	613	0	275	624	1	0	352	203	0	445	125
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	176	613	0	275	625	0	0	555	0	0	570	0
Confl. Peds. (#/hr)	1		5	5		1			15			20
Confl. Bikes (#/hr)			3									2
Heavy Vehicles (%)	5%	4%	0%	4%	5%	100%	0%	9%	9%	0%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	3	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA		pm+pt	NA			NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	47.0	47.0		64.0	63.0			29.0			29.0	
Effective Green, g (s)	47.0	47.0		64.0	63.0			29.0			29.0	
Actuated g/C Ratio	0.47	0.47		0.64	0.63			0.29			0.29	
Clearance Time (s)	4.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	303	1545		511	1980			822			840	
v/s Ratio Prot		0.19		c0.07	0.20			0.20			c0.20	
v/s Ratio Perm	c0.27			0.27								
v/c Ratio	0.58	0.40		0.54	0.32			0.68			0.68	
Uniform Delay, d1	19.3	17.3		15.6	8.5			31.3			31.4	
Progression Factor	1.00	1.00		1.00	1.00			0.56			0.97	
Incremental Delay, d2	7.9	0.8		4.0	0.4			4.1			4.1	
Delay (s)	27.2	18.0		19.6	9.0			21.8			34.6	
Level of Service	C	B		B	A			C			C	
Approach Delay (s)		20.1			12.2			21.8			34.6	
Approach LOS		C			B			C			C	

Intersection Summary

HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1084: Ashland Ave. □ W Monroe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	0	72	31	46	20	21	0	636	50	0	497	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frbp, ped/bikes		0.99			0.99			0.99			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.96			0.97			0.99			1.00	
Flt Protected		1.00			0.97			1.00			1.00	
Satd. Flow (prot)		1561			1439			2672			3019	
Flt Permitted		1.00			0.82			1.00			1.00	
Satd. Flow (perm)		1561			1210			2672			3019	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	0	79	34	51	22	23	0	699	55	0	546	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	113	0	0	96	0	0	754	0	0	547	0
Confl. Peds. (#/hr)	5		15	15		5			39			16
Confl. Bikes (#/hr)			2			1			1			
Heavy Vehicles (%)	0%	3%	0%	9%	10%	5%	0%	8%	2%	1%	4%	0%
Parking (#/hr)								24	24		0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		28.0			28.0			64.0			64.0	
Effective Green, g (s)		28.0			28.0			64.0			64.0	
Actuated g/C Ratio		0.28			0.28			0.64			0.64	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		437			338			1710			1932	
v/s Ratio Prot		0.07						c0.28			0.18	
v/s Ratio Perm					c0.08							
v/c Ratio		0.26			0.28			0.44			0.28	
Uniform Delay, d1		27.9			28.2			9.0			7.9	
Progression Factor		1.00			1.00			0.41			0.48	
Incremental Delay, d2		1.4			2.1			0.7			0.3	
Delay (s)		29.4			30.3			4.5			4.1	
Level of Service		C			C			A			A	
Approach Delay (s)		29.4			30.3			4.5			4.1	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1085: Ashland Ave. □ W Adams St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕			↕↕			↕↕	
Volume (vph)	0	0	0	202	140	145	0	538	0	0	493	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			0.95			0.95	
Frbp, ped/bikes					0.98			1.00			0.99	
Flpb, ped/bikes					0.97			1.00			1.00	
Frt					0.96			1.00			0.99	
Flt Protected					0.98			1.00			1.00	
Satd. Flow (prot)					2717			2495			2858	
Flt Permitted					0.98			1.00			1.00	
Satd. Flow (perm)					2717			2495			2858	
Peak-hour factor, PHF	0.91	0.95	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	0	0	0	222	154	159	0	591	0	0	542	36
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	535	0	0	591	0	0	578	0
Confl. Peds. (#/hr)			53	53		32			25			45
Confl. Bikes (#/hr)			1			1			2			3
Heavy Vehicles (%)	6%	0%	0%	5%	6%	3%	0%	8%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								54			12	12
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					42.0			50.0			50.0	
Effective Green, g (s)					42.0			50.0			50.0	
Actuated g/C Ratio					0.42			0.50			0.50	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					1141			1247			1429	
v/s Ratio Prot								c0.24			0.20	
v/s Ratio Perm					0.20							
v/c Ratio					0.47			0.47			0.40	
Uniform Delay, d1					20.9			16.4			15.7	
Progression Factor					1.00			0.12			0.50	
Incremental Delay, d2					1.4			1.2			0.8	
Delay (s)					22.3			3.2			8.6	
Level of Service					C			A			A	
Approach Delay (s)		0.0			22.3			3.2			8.6	
Approach LOS		A			C			A			A	

Intersection Summary

HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1086: Ashland Ave. □ W Jackson Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕			↕↕	
Volume (vph)	34	166	88	0	0	0	0	498	52	0	496	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0					4.0			4.0	
Lane Util. Factor		0.95	1.00					0.95			0.95	
Frbp, ped/bikes		1.00	0.97					1.00			1.00	
Flpb, ped/bikes		1.00	1.00					1.00			1.00	
Frt		1.00	0.85					0.99			1.00	
Flt Protected		0.99	1.00					1.00			1.00	
Satd. Flow (prot)		3217	1455					2966			2781	
Flt Permitted		0.99	1.00					1.00			1.00	
Satd. Flow (perm)		3217	1455					2966			2781	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.88	0.91	0.92	0.91	0.91	0.88	0.91	0.91
Adj. Flow (vph)	37	182	97	0	0	0	0	547	57	0	545	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	219	97	0	0	0	0	604	0	0	545	0
Confl. Peds. (#/hr)	12		16				12		9			17
Heavy Vehicles (%)	6%	5%	2%	2%	0%	0%	2%	10%	6%	4%	7%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)									0		20	
Turn Type	Perm	NA	Perm					NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4		4									
Actuated Green, G (s)		36.0	36.0					55.0			55.0	
Effective Green, g (s)		36.0	36.0					55.0			55.0	
Actuated g/C Ratio		0.36	0.36					0.55			0.55	
Clearance Time (s)		5.0	5.0					4.0			4.0	
Lane Grp Cap (vph)		1158	523					1631			1529	
v/s Ratio Prot								c0.20			0.20	
v/s Ratio Perm		0.07	0.07									
v/c Ratio		0.19	0.19					0.37			0.36	
Uniform Delay, d1		22.0	21.9					12.7			12.6	
Progression Factor		1.00	1.00					0.61			0.85	
Incremental Delay, d2		0.4	0.8					0.6			0.6	
Delay (s)		22.3	22.7					8.3			11.3	
Level of Service		C	C					A			B	
Approach Delay (s)		22.5			0.0			8.3			11.3	
Approach LOS		C			A			A			B	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1088: Ashland Ave. □ W Van Buren St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕	↗	↙	↕			↕	↗
Volume (vph)	0	0	0	748	288	193	405	502	0	0	645	125
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor				0.91	0.91	1.00	1.00	0.95			0.95	
Frbp, ped/bikes				1.00	1.00	0.96	1.00	1.00			0.99	
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	
Frt				1.00	1.00	0.85	1.00	1.00			0.98	
Flt Protected				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1489	2998	1353	1589	2855			2891	
Flt Permitted				0.95	0.97	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1489	2998	1353	1589	2855			2891	
Peak-hour factor, PHF	0.91	0.99	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.99	0.91	0.91
Adj. Flow (vph)	0	0	0	822	316	212	445	552	0	0	709	137
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	411	727	212	445	552	0	0	846	0
Confl. Peds. (#/hr)			2	2		19	13		9			13
Confl. Bikes (#/hr)						1			2			2
Heavy Vehicles (%)	7%	0%	0%	1%	5%	5%	4%	10%	0%	0%	5%	6%
Parking (#/hr)								0				0
Turn Type				Split	NA	Perm	Prot	NA			NA	
Protected Phases				8	8		5	5 6			6 16	
Permitted Phases						8						
Actuated Green, G (s)				26.0	26.0	26.0	34.0	48.0			28.0	
Effective Green, g (s)				26.0	26.0	26.0	34.0	48.0			26.0	
Actuated g/C Ratio				0.26	0.26	0.26	0.34	0.48			0.26	
Clearance Time (s)				4.0	4.0	4.0	4.0					
Lane Grp Cap (vph)				387	779	351	540	1370			751	
v/s Ratio Prot				c0.28	0.24		c0.28	0.19			c0.29	
v/s Ratio Perm						0.16						
v/c Ratio				1.06	1.02dl	0.60	0.82	0.40			1.13	
Uniform Delay, d1				37.0	36.2	32.5	30.3	16.8			37.0	
Progression Factor				1.00	1.00	1.00	0.47	0.48			0.80	
Incremental Delay, d2				63.1	19.6	7.5	6.0	0.4			73.2	
Delay (s)				100.1	55.7	40.0	20.2	8.3			102.9	
Level of Service				F	E	D	C	A			F	
Approach Delay (s)		0.0			66.8			13.6			102.9	
Approach LOS		A			E			B			F	

Intersection Summary

HCM 2000 Control Delay	59.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1089: Ashland Ave. □ W Congress Pkwy

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕		↗	↕↕	
Volume (vph)	150	172	221	0	0	0	0	808	253	259	880	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0					2.0		4.0	4.0	
Lane Util. Factor		0.95	1.00					0.95		1.00	0.95	
Frbp, ped/bikes		1.00	0.98					0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.96		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		3155	1471					2810		1589	3031	
Flt Permitted		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		3155	1471					2810		1589	3031	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.96	0.91	0.96	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	165	189	243	0	0	0	0	888	278	285	967	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	354	243	0	0	0	0	1166	0	285	967	0
Confl. Peds. (#/hr)			6						3	3		2
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	7%	5%	2%	1%	0%	0%	0%	8%	2%	4%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	Split	NA	Perm					NA		Prot	NA	
Protected Phases	4	4						2 12		1	1 2	
Permitted Phases			4									
Actuated Green, G (s)		26.0	26.0					42.0		22.0	42.0	
Effective Green, g (s)		26.0	26.0					42.0		22.0	42.0	
Actuated g/C Ratio		0.26	0.26					0.42		0.22	0.42	
Clearance Time (s)		4.0	4.0							4.0		
Lane Grp Cap (vph)		820	382					1180		349	1273	
v/s Ratio Prot		0.11						c0.41		c0.18	0.32	
v/s Ratio Perm			c0.17									
v/c Ratio		0.43	0.64					0.99		0.82	0.76	
Uniform Delay, d1		30.8	32.8					28.8		37.1	24.7	
Progression Factor		1.00	1.00					0.89		1.06	0.89	
Incremental Delay, d2		1.7	7.9					20.6		2.0	0.4	
Delay (s)		32.5	40.7					46.1		41.3	22.4	
Level of Service		C	D					D		D	C	
Approach Delay (s)		35.8			0.0			46.1			26.7	
Approach LOS		D			A			D			C	

Intersection Summary		
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.88	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 14.0
Intersection Capacity Utilization	93.5%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1090: Ashland Ave. □ W Harrison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↔		↖	↕			↕			↕	
Volume (vph)	174	124	52	100	202	81	0	959	37	0	904	247
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	0.91	0.91		1.00	0.95			0.95			0.95	
Frbp, ped/bikes	1.00	0.98		1.00	0.98			1.00			0.99	
Flpb, ped/bikes	0.99	1.00		0.95	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.96			0.99			0.97	
Flt Protected	0.95	0.99		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1493	2925		1512	2865			2868			2901	
Flt Permitted	0.43	0.75		0.58	1.00			1.00			1.00	
Satd. Flow (perm)	679	2221		927	2865			2868			2901	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	191	136	57	110	222	89	0	1054	41	0	993	271
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	120	264	0	110	311	0	0	1095	0	0	1264	0
Confl. Peds. (#/hr)	31		71	71		31			41			22
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	0%	2%	0%	0%	7%	0%	0%	8%	8%	3%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	pm+pt	NA		Perm	NA			NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	33.0	33.0		22.0	22.0			57.0			57.0	
Effective Green, g (s)	33.0	33.0		22.0	22.0			57.0			57.0	
Actuated g/C Ratio	0.33	0.33		0.22	0.22			0.57			0.57	
Clearance Time (s)	3.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	289	789		203	630			1634			1653	
v/s Ratio Prot	c0.03	0.03			0.11			0.38			c0.44	
v/s Ratio Perm	0.10	0.08		c0.12								
v/c Ratio	0.42	0.33		0.54	0.49			0.67			0.76	
Uniform Delay, d1	24.6	25.2		34.5	34.1			15.0			16.4	
Progression Factor	1.00	1.00		1.00	1.00			0.55			0.83	
Incremental Delay, d2	4.4	1.1		10.0	2.8			1.9			2.3	
Delay (s)	29.0	26.4		44.5	36.9			10.2			15.9	
Level of Service	C	C		D	D			B			B	
Approach Delay (s)		27.2			38.9			10.2			15.9	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1091: Ashland Ave. □ W Flourney St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔		↔		↔			↕↕			↕↕	
Volume (vph)	108	0	14	2	0	11	0	956	3	0	637	299
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0		5.0		5.0			4.0			4.0	
Lane Util. Factor	0.97		1.00		1.00			0.95			0.95	
Frbp, ped/bikes	1.00		0.99		0.98			1.00			0.98	
Flpb, ped/bikes	0.98		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.88			1.00			0.95	
Flt Protected	0.95		1.00		0.99			1.00			1.00	
Satd. Flow (prot)	3044		1409		1550			2934			2874	
Flt Permitted	0.75		1.00		0.99			1.00			1.00	
Satd. Flow (perm)	2398		1409		1550			2934			2874	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	119	0	15	2	0	12	0	1051	3	0	700	329
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	119	0	15	0	14	0	0	1054	0	0	1029	0
Confl. Peds. (#/hr)	9		1	1		9			21			14
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	3%	0%
Parking (#/hr)								0			0	
Turn Type	custom		custom	Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	28.0		28.0		28.0			63.0			63.0	
Effective Green, g (s)	28.0		28.0		28.0			63.0			63.0	
Actuated g/C Ratio	0.28		0.28		0.28			0.63			0.63	
Clearance Time (s)	5.0		5.0		5.0			4.0			4.0	
Lane Grp Cap (vph)	671		394		434			1848			1810	
v/s Ratio Prot								c0.36			0.36	
v/s Ratio Perm	c0.05		0.01		0.01							
v/c Ratio	0.18		0.04		0.03			0.57			0.57	
Uniform Delay, d1	27.3		26.2		26.2			10.7			10.7	
Progression Factor	1.00		1.00		1.00			1.12			0.28	
Incremental Delay, d2	0.6		0.2		0.1			1.1			0.9	
Delay (s)	27.9		26.4		26.3			13.1			3.8	
Level of Service	C		C		C			B			A	
Approach Delay (s)		27.7			26.3			13.1			3.8	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1092: Ashland Ave. □ W Polk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	86	16	37	6	28	70	0	902	10	0	563	147
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frbp, ped/bikes		0.95			0.93			1.00			0.98	
Flpb, ped/bikes		0.96			0.99			1.00			1.00	
Frt		0.96			0.91			1.00			0.97	
Flt Protected		0.97			1.00			1.00			1.00	
Satd. Flow (prot)		1429			1411			2876			2821	
Flt Permitted		0.78			0.99			1.00			1.00	
Satd. Flow (perm)		1149			1395			2876			2821	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	95	18	41	7	31	77	0	991	11	0	619	162
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	154	0	0	115	0	0	1002	0	0	781	0
Confl. Peds. (#/hr)	60		129	129		60			39			14
Confl. Bikes (#/hr)			4			6			5			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	8%	20%	0%	6%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		30.0			30.0			62.0			62.0	
Effective Green, g (s)		30.0			30.0			62.0			62.0	
Actuated g/C Ratio		0.30			0.30			0.62			0.62	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		344			418			1783			1749	
v/s Ratio Prot								c0.35			0.28	
v/s Ratio Perm		c0.13			0.08							
v/c Ratio		0.45			0.28			0.56			0.45	
Uniform Delay, d1		28.3			26.7			11.1			10.0	
Progression Factor		1.00			1.00			1.11			0.26	
Incremental Delay, d2		4.2			1.6			1.2			0.7	
Delay (s)		32.5			28.3			13.5			3.3	
Level of Service		C			C			B			A	
Approach Delay (s)		32.5			28.3			13.5			3.3	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1093: Ashland Ave. □ W Taylor St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↑↔			↑↔	
Volume (vph)	36	123	37	44	254	68	0	656	95	0	312	192
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95			0.95	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.85		0.98			0.97	
Flpb, ped/bikes	0.92	1.00	1.00	0.98	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1472	1570	1369	1559	1600	1188		2747			2675	
Flt Permitted	0.46	1.00	1.00	0.65	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	716	1570	1369	1064	1600	1188		2747			2675	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	40	135	41	48	279	75	0	721	104	0	343	211
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	40	135	41	48	279	75	0	825	0	0	554	0
Confl. Peds. (#/hr)	98		20	20		98			23			15
Confl. Bikes (#/hr)			2			5			1			3
Heavy Vehicles (%)	0%	7%	0%	0%	5%	2%	0%	10%	8%	6%	9%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	36.0	36.0	36.0	36.0	36.0	36.0		55.0			55.0	
Effective Green, g (s)	36.0	36.0	36.0	36.0	36.0	36.0		55.0			55.0	
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36		0.55			0.55	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		5.0			5.0	
Lane Grp Cap (vph)	257	565	492	383	576	427		1510			1471	
v/s Ratio Prot		0.09			c0.17			c0.30			0.21	
v/s Ratio Perm	0.06		0.03	0.05		0.06						
v/c Ratio	0.16	0.24	0.08	0.13	0.48	0.18		0.55			0.38	
Uniform Delay, d1	21.7	22.4	21.1	21.4	24.8	21.9		14.5			12.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.72			0.29	
Incremental Delay, d2	1.3	1.0	0.3	0.7	2.9	0.9		0.6			0.7	
Delay (s)	23.0	23.4	21.4	22.1	27.7	22.8		11.1			4.4	
Level of Service	C	C	C	C	C	C		B			A	
Approach Delay (s)		23.0			26.1			11.1			4.4	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1094: Ashland Ave. □ W Roosevelt Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	862	108	126	1016	259	0	619	115	0	334	83
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.96		1.00	0.93		1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1564	3069	1286	1505	3099	1337		1491	1214		1657	1249
Flt Permitted	0.11	1.00	1.00	0.13	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	188	3069	1286	207	3099	1337		1491	1214		1657	1249
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	144	947	119	138	1116	285	0	680	126	0	367	91
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	144	947	119	138	1116	285	0	680	126	0	367	91
Confl. Peds. (#/hr)	28		24	24		28			52			29
Confl. Bikes (#/hr)						4			3			1
Heavy Vehicles (%)	2%	4%	4%	6%	3%	2%	5%	5%	1%	3%	5%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0			0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	42.0	35.0	35.0	42.0	35.0	35.0		45.0	45.0		45.0	45.0
Effective Green, g (s)	42.0	35.0	35.0	42.0	35.0	35.0		45.0	45.0		45.0	45.0
Actuated g/C Ratio	0.42	0.35	0.35	0.42	0.35	0.35		0.45	0.45		0.45	0.45
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	175	1074	450	177	1084	467		670	546		745	562
v/s Ratio Prot	c0.06	0.31		0.05	c0.36			c0.46			0.22	
v/s Ratio Perm	0.29		0.09	0.27		0.21			0.10			0.07
v/c Ratio	0.82	0.88	0.26	0.78	1.03	0.61		1.01	0.23		0.49	0.16
Uniform Delay, d1	22.8	30.6	23.3	21.3	32.5	26.9		27.5	16.9		19.4	16.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.72	0.58		0.88	0.96
Incremental Delay, d2	28.3	10.4	1.4	22.1	35.2	5.8		34.7	0.8		2.2	0.6
Delay (s)	51.2	41.0	24.7	43.4	67.7	32.7		54.6	10.6		19.4	16.3
Level of Service	D	D	C	D	E	C		D	B		B	B
Approach Delay (s)		40.6			59.0			47.7			18.8	
Approach LOS		D			E			D			B	

Intersection Summary

HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1096: Ashland Ave. □ W 13th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	50	0	35	2	0	1	0	703	2	0	342	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		0.99			0.99			1.00			1.00	
Frt		0.94			0.95			1.00			0.99	
Flt Protected		0.97			0.97			1.00			1.00	
Satd. Flow (prot)		1507			1624			1448			1464	
Flt Permitted		0.82			0.88			1.00			1.00	
Satd. Flow (perm)		1267			1470			1448			1464	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	55	0	38	2	0	1	0	773	2	0	376	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	93	0	0	3	0	0	775	0	0	401	0
Confl. Peds. (#/hr)	2		7	7		2			8			10
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	6%	0%	8%	0%	6%	0%	4%	8%	50%	0%	6%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		11.3			11.3			80.7			80.7	
Effective Green, g (s)		11.3			11.3			80.7			80.7	
Actuated g/C Ratio		0.11			0.11			0.81			0.81	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		143			166			1168			1181	
v/s Ratio Prot								c0.54			0.27	
v/s Ratio Perm		c0.07			0.00							
v/c Ratio		0.65			0.02			0.66			0.34	
Uniform Delay, d1		42.5			39.4			4.0			2.6	
Progression Factor		1.00			1.00			0.00			0.66	
Incremental Delay, d2		13.4			0.1			1.3			0.7	
Delay (s)		55.8			39.5			1.3			2.4	
Level of Service		E			D			A			A	
Approach Delay (s)		55.8			39.5			1.3			2.4	
Approach LOS		E			D			A			A	

Intersection Summary

HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1098: Ashland Ave. □ W 14th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	0	0	20	11	0	3	0	758	0	0	298	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.90			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			0.94			1.00			1.00	
Frt		0.86			0.97			1.00			1.00	
Flt Protected		1.00			0.96			1.00			1.00	
Satd. Flow (prot)		1406			1586			1297			1446	
Flt Permitted		1.00			0.86			1.00			1.00	
Satd. Flow (perm)		1406			1426			1297			1446	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	0	0	22	12	0	3	0	833	0	0	327	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	22	0	0	15	0	0	833	0	0	334	0
Confl. Peds. (#/hr)			30	30					6			9
Confl. Bikes (#/hr)			2						2			2
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%	2%	10%	0%	4%	8%	0%
Parking (#/hr)								16			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		20.0			20.0			72.0			72.0	
Effective Green, g (s)		20.0			20.0			72.0			72.0	
Actuated g/C Ratio		0.20			0.20			0.72			0.72	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		281			285			933			1041	
v/s Ratio Prot		c0.02						c0.64			0.23	
v/s Ratio Perm					0.01							
v/c Ratio		0.08			0.05			0.89			0.32	
Uniform Delay, d1		32.5			32.3			11.0			5.1	
Progression Factor		1.00			1.00			1.00			0.78	
Incremental Delay, d2		0.5			0.4			12.7			0.8	
Delay (s)		33.1			32.7			23.7			4.7	
Level of Service		C			C			C			A	
Approach Delay (s)		33.1			32.7			23.7			4.7	
Approach LOS		C			C			C			A	

Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1103: Ashland Ave. □ W 18th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	257	93	68	358	148	0	759	88	0	294	57
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.74		1.00	0.84		1.00	0.86
Flpb, ped/bikes	0.91	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1393	1600	1245	1501	1585	1039		1289	1115		1254	1065
Flt Permitted	0.19	1.00	1.00	0.37	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	280	1600	1245	586	1585	1039		1289	1115		1254	1065
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	74	282	102	75	393	163	0	834	97	0	323	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	74	282	102	75	393	163	0	834	97	0	323	63
Confl. Peds. (#/hr)	117		28	28		117			43			39
Confl. Bikes (#/hr)			6			3						1
Heavy Vehicles (%)	4%	5%	5%	3%	6%	2%	1%	8%	12%	6%	11%	19%
Parking (#/hr)								20			20	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	23.0	23.0	23.0	23.0	23.0	23.0		56.0	56.0		56.0	56.0
Effective Green, g (s)	23.0	23.0	23.0	23.0	23.0	23.0		56.0	56.0		56.0	56.0
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26		0.62	0.62		0.62	0.62
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	71	408	318	149	405	265		802	693		780	662
v/s Ratio Prot		0.18			0.25			c0.65			0.26	
v/s Ratio Perm	c0.26		0.08	0.13		0.16			0.09			0.06
v/c Ratio	1.04	0.69	0.32	0.50	0.97	0.62		1.04	0.14		0.41	0.10
Uniform Delay, d1	33.5	30.3	27.2	28.6	33.2	29.6		17.0	7.0		8.7	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.63	0.57		1.00	1.00
Incremental Delay, d2	119.0	9.3	2.6	11.6	37.9	10.2		30.7	0.2		1.6	0.3
Delay (s)	152.5	39.5	29.8	40.3	71.1	39.8		41.5	4.1		10.3	7.1
Level of Service	F	D	C	D	E	D		D	A		B	A
Approach Delay (s)		55.6			59.3			37.6			9.8	
Approach LOS		E			E			D			A	

Intersection Summary

HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1105: Ashland Ave. □ W 19th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	58	44	18	43	77	75	0	824	7	0	519	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.97			0.93			1.00			0.99	
Flpb, ped/bikes		0.95			0.97			1.00			1.00	
Frt		0.98			0.95			1.00			0.99	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1556			1487			1333			1234	
Flt Permitted		0.68			0.92			1.00			1.00	
Satd. Flow (perm)		1085			1380			1333			1234	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	64	48	20	47	85	82	0	905	8	0	570	40
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	132	0	0	214	0	0	913	0	0	610	0
Confl. Peds. (#/hr)	73		75	75		73			59			40
Confl. Bikes (#/hr)			1			1			1			2
Heavy Vehicles (%)	5%	0%	0%	0%	0%	6%	6%	8%	0%	0%	8%	3%
Parking (#/hr)								14				24
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		19.0			19.0			63.0			63.0	
Effective Green, g (s)		19.0			19.0			63.0			63.0	
Actuated g/C Ratio		0.21			0.21			0.70			0.70	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		229			291			933			863	
v/s Ratio Prot								c0.68			0.49	
v/s Ratio Perm		0.12			c0.16							
v/c Ratio		0.58			0.74			0.98			0.71	
Uniform Delay, d1		31.9			33.2			12.9			8.0	
Progression Factor		1.00			1.00			0.81			0.64	
Incremental Delay, d2		10.2			15.2			18.9			4.7	
Delay (s)		42.0			48.4			29.3			9.8	
Level of Service		D			D			C			A	
Approach Delay (s)		42.0			48.4			29.3			9.8	
Approach LOS		D			D			C			A	

Intersection Summary

HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1107: Ashland Ave. □ W 21st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	45	176	9	97	132	33	0	669	32	0	535	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.99			0.99			0.99	
Flpb, ped/bikes		0.99			0.97			1.00			1.00	
Frt		0.99			0.98			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1702			1582			1287			1317	
Flt Permitted		0.88			0.69			1.00			1.00	
Satd. Flow (perm)		1503			1106			1287			1317	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	49	193	10	107	145	36	0	735	35	0	588	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	252	0	0	288	0	0	770	0	0	612	0
Confl. Peds. (#/hr)	49		88	88		49			32			43
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	9%	1%	0%	4%	3%	13%	0%	7%	3%	2%	10%	0%
Parking (#/hr)								20			12	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			58.0			58.0	
Effective Green, g (s)		24.0			24.0			58.0			58.0	
Actuated g/C Ratio		0.27			0.27			0.64			0.64	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		400			294			829			848	
v/s Ratio Prot								c0.60			0.46	
v/s Ratio Perm		0.17			c0.26							
v/c Ratio		0.63			0.98			0.93			0.72	
Uniform Delay, d1		29.1			32.8			14.2			10.6	
Progression Factor		1.00			1.00			0.49			0.47	
Incremental Delay, d2		4.4			46.8			2.4			4.0	
Delay (s)		33.5			79.5			9.2			9.0	
Level of Service		C			E			A			A	
Approach Delay (s)		33.5			79.5			9.2			9.0	
Approach LOS		C			E			A			A	

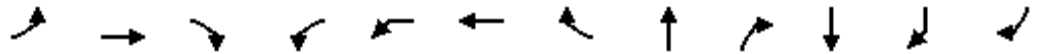
Intersection Summary

HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBT	NBR	SBT	SBR	SBR2
Lane Configurations	↖	↗			↘	↙		↑	↗	↑	↘	
Volume (vph)	75	349	52	92	92	495	173	604	98	486	130	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	12	11	10	11	12	11	11	11	11	11
Total Lost time (s)	4.0	4.0			3.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			1.00	0.95		1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00			1.00	0.92		1.00	0.99	1.00	0.89	
Flpb, ped/bikes	0.90	1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.98			1.00	0.96		1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00			0.95	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1296	3016			1347	2678		862	721	1402	962	
Flt Permitted	0.29	1.00			0.31	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (perm)	396	3016			433	2678		862	721	1402	962	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	82	384	57	101	101	544	190	664	108	534	143	29
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	82	441	0	0	202	734	0	664	108	534	172	0
Confl. Peds. (#/hr)	155						155				50	
Confl. Bikes (#/hr)							5		1		3	
Heavy Vehicles (%)	11%	8%	4%	15%	22%	8%	11%	7%	6%	8%	18%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	3	0
Parking (#/hr)								74	74	6	6	
Turn Type	Perm	NA		pm+pt	pm+pt	NA		NA	Perm	NA	Perm	
Protected Phases		4		3	3	8		2		6		
Permitted Phases	4			8	8				2		6	
Actuated Green, G (s)	21.0	21.0			29.0	29.0		37.0	37.0	37.0	37.0	
Effective Green, g (s)	21.0	21.0			29.0	29.0		37.0	37.0	37.0	37.0	
Actuated g/C Ratio	0.23	0.23			0.32	0.32		0.41	0.41	0.41	0.41	
Clearance Time (s)	4.0	4.0			3.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	92	703			190	862		354	296	576	395	
v/s Ratio Prot		0.15			c0.06	0.27		c0.77		0.38		
v/s Ratio Perm	0.21				c0.28				0.15		0.18	
v/c Ratio	0.89	0.63			1.06	0.85		1.88	0.36	0.93	0.44	
Uniform Delay, d1	33.4	31.0			30.1	28.5		26.5	18.4	25.2	19.0	
Progression Factor	1.00	1.00			1.00	1.00		0.98	0.94	0.80	0.86	
Incremental Delay, d2	59.6	1.8			83.0	8.1		403.1	2.9	16.3	0.5	
Delay (s)	93.0	32.7			113.1	36.6		429.0	20.1	36.4	16.9	
Level of Service	F	C			F	D		F	C	D	B	
Approach Delay (s)		42.2				53.1		371.8		31.7		
Approach LOS		D				D		F		C		

Intersection Summary			
HCM 2000 Control Delay	145.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	NEL	NER	NER2
Lane Configurations			
Volume (vph)	208	204	37
Ideal Flow (vphpl)	1800	1800	1800
Lane Width	11	12	12
Total Lost time (s)	4.0	4.0	
Lane Util. Factor	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.85	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1401	1329	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1401	1329	
Peak-hour factor, PHF	0.91	0.91	0.91
Adj. Flow (vph)	229	224	41
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	229	265	0
Confl. Peds. (#/hr)			
Confl. Bikes (#/hr)			
Heavy Vehicles (%)	18%	15%	16%
Bus Blockages (#/hr)	0	0	0
Parking (#/hr)			
Turn Type	NA	Perm	
Protected Phases	9		
Permitted Phases		9	
Actuated Green, G (s)	12.0	12.0	
Effective Green, g (s)	12.0	12.0	
Actuated g/C Ratio	0.13	0.13	
Clearance Time (s)	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	186	177	
v/s Ratio Prot	0.16		
v/s Ratio Perm		c0.20	
v/c Ratio	1.23	1.50	
Uniform Delay, d1	39.0	39.0	
Progression Factor	1.00	1.00	
Incremental Delay, d2	141.8	251.0	
Delay (s)	180.8	290.0	
Level of Service	F	F	
Approach Delay (s)	239.4		
Approach LOS	F		

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1110: Ashland Ave. □ 2451 S Ashland Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↔			↔	
Volume (vph)	2	0	3	2	0	0	0	757	0	0	563	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.95			1.00			1.00			1.00	
Flpb, ped/bikes		0.99			0.94			1.00			1.00	
Frt		0.92			1.00			1.00			1.00	
Flt Protected		0.98			0.95			1.00			1.00	
Satd. Flow (prot)		1531			807			1596			1672	
Flt Permitted		1.00			1.00			1.00			1.00	
Satd. Flow (perm)		1562			850			1596			1672	
Peak-hour factor, PHF	0.91	0.94	0.91	0.91	0.94	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	2	0	3	2	0	0	0	832	0	0	619	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	5	0	0	2	0	0	832	0	0	621	0
Confl. Peds. (#/hr)	1		2	2		1			2			1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	100%	0%	0%	14%	9%	0%	25%	4%	0%
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		1.6			1.6			78.4			78.4	
Effective Green, g (s)		1.6			1.6			78.4			78.4	
Actuated g/C Ratio		0.02			0.02			0.87			0.87	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		27			15			1390			1456	
v/s Ratio Prot								c0.52			0.37	
v/s Ratio Perm		c0.00			0.00							
v/c Ratio		0.19			0.13			0.60			0.43	
Uniform Delay, d1		43.6			43.5			1.6			1.2	
Progression Factor		1.00			1.00			1.00			0.50	
Incremental Delay, d2		6.8			8.3			1.9			0.3	
Delay (s)		50.4			51.8			3.5			0.9	
Level of Service		D			D			A			A	
Approach Delay (s)		50.4			51.8			3.5			0.9	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			2.6					HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		10.0		
Intersection Capacity Utilization			53.7%					ICU Level of Service		A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1111: Ashland Ave. □ W 27th St.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	1	0	775	645	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)		4.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00	
Frbp, ped/bikes		1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	
Frt		0.85		1.00	1.00	
Flt Protected		1.00		1.00	1.00	
Satd. Flow (prot)		765		1642	1582	
Flt Permitted		1.00		1.00	1.00	
Satd. Flow (perm)		765		1642	1582	
Peak-hour factor, PHF	0.91	0.91	0.96	0.91	0.91	0.91
Adj. Flow (vph)	0	1	0	852	709	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1	0	852	709	0
Confl. Peds. (#/hr)						2
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	100%	50%	6%	10%	0%
Bus Blockages (#/hr)	0	0	0	0	0	3
Turn Type		Perm		NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4				6
Actuated Green, G (s)		1.3		89.7	89.7	
Effective Green, g (s)		1.3		89.7	89.7	
Actuated g/C Ratio		0.01		0.90	0.90	
Clearance Time (s)		4.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0	
Lane Grp Cap (vph)		9		1472	1419	
v/s Ratio Prot				c0.52	0.45	
v/s Ratio Perm		c0.00				
v/c Ratio		0.11		0.58	0.50	
Uniform Delay, d1		48.8		1.1	1.0	
Progression Factor		1.00		0.56	1.00	
Incremental Delay, d2		5.4		1.0	1.3	
Delay (s)		54.2		1.6	2.2	
Level of Service		D		A	A	
Approach Delay (s)	54.2			1.6	2.2	
Approach LOS	D			A	A	

Intersection Summary

HCM 2000 Control Delay	1.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1112: Ashland Ave. □ W Marketplace Access Rd.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	17	0	745	574	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)	4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1096	1012		1171	1138	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1096	1012		1171	1138	
Peak-hour factor, PHF	0.91	0.91	0.92	0.91	0.91	0.91
Adj. Flow (vph)	35	19	0	819	631	20
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	35	19	0	819	651	0
Confl. Peds. (#/hr)		1				3
Confl. Bikes (#/hr)						3
Heavy Vehicles (%)	56%	47%	29%	4%	7%	39%
Parking (#/hr)				40	38	
Turn Type	NA	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	6.3	6.3		84.7	84.7	
Effective Green, g (s)	6.3	6.3		84.7	84.7	
Actuated g/C Ratio	0.06	0.06		0.85	0.85	
Clearance Time (s)	4.0	4.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	69	63		991	963	
v/s Ratio Prot	c0.03			c0.70	0.57	
v/s Ratio Perm		0.02				
v/c Ratio	0.51	0.30		0.83	0.68	
Uniform Delay, d1	45.3	44.7		3.9	2.7	
Progression Factor	1.00	1.00		1.55	0.83	
Incremental Delay, d2	5.8	2.7		4.4	3.4	
Delay (s)	51.1	47.4		10.5	5.7	
Level of Service	D	D		B	A	
Approach Delay (s)	49.8			10.5	5.7	
Approach LOS	D			B	A	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1113: Ashland Ave. □ W 31st Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	388	0	187	15	0	15	0	471	15	15	467	182
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	4.0		4.0		4.0			12.0		2.0	12.0	12.0
Lane Util. Factor	1.00		1.00		1.00			1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00		1.00		1.00			1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00		1.00			1.00		0.99	1.00	1.00
Frt	1.00		0.85		0.93			1.00		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1605		1222		819			1602		820	1611	1352
Flt Permitted	0.95		1.00		0.98			1.00		0.32	1.00	1.00
Satd. Flow (perm)	1605		1222		819			1602		275	1611	1352
Peak-hour factor, PHF	0.91	0.96	0.91	0.91	0.96	0.91	0.96	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	426	0	205	16	0	16	0	518	16	16	513	200
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	426	0	205	0	32	0	0	534	0	16	513	200
Confl. Peds. (#/hr)									47	47		1
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	0%	21%	100%	0%	100%	0%	5%	100%	100%	8%	7%
Turn Type	Split		Perm	Split	NA			NA		pm+pt	NA	Perm
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases			4							6		6
Actuated Green, G (s)	28.0		28.0		4.8			42.8		47.2	47.2	47.2
Effective Green, g (s)	28.0		28.0		4.8			42.8		47.2	47.2	47.2
Actuated g/C Ratio	0.28		0.28		0.05			0.43		0.47	0.47	0.47
Clearance Time (s)	4.0		4.0		4.0			12.0		2.0	12.0	12.0
Vehicle Extension (s)	3.0		3.0		3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	449		342		39			685		142	760	638
v/s Ratio Prot	c0.27				c0.04			c0.33		0.00	c0.32	
v/s Ratio Perm			0.17							0.05		0.15
v/c Ratio	0.95		0.60		0.82			0.78		0.11	0.68	0.31
Uniform Delay, d1	35.3		31.1		47.2			24.6		15.3	20.5	16.4
Progression Factor	1.00		1.00		1.00			1.08		0.76	0.89	0.87
Incremental Delay, d2	31.4		7.6		76.9			5.5		0.3	4.0	1.1
Delay (s)	66.7		38.7		124.1			32.2		11.9	22.1	15.3
Level of Service	E		D		F			C		B	C	B
Approach Delay (s)		57.6			124.1			32.2			20.0	
Approach LOS		E			F			C			C	

Intersection Summary

HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1114: Ashland Ave. □ S Archer Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑			↑	
Volume (vph)	172	1087	24	78	630	77	0	368	131	0	294	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	11	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1604	4630		1573	4323			1406			1523	
Flt Permitted	0.25	1.00		0.14	1.00			1.00			1.00	
Satd. Flow (perm)	417	4630		227	4323			1406			1523	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	189	1195	26	86	692	85	0	404	144	0	323	66
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	189	1221	0	86	777	0	0	548	0	0	389	0
Confl. Peds. (#/hr)	5		32	32		5			27			19
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	3%	2%	8%	5%	4%	4%	100%	7%	5%	7%	12%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0			18
Turn Type	pm+pt	NA		pm+pt	NA			NA			NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	45.6	37.0		39.2	33.6			44.4			44.4	
Effective Green, g (s)	45.6	37.0		39.2	33.6			44.4			44.4	
Actuated g/C Ratio	0.46	0.37		0.39	0.34			0.44			0.44	
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0			5.0	
Vehicle Extension (s)	5.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	296	1713		164	1452			624			676	
v/s Ratio Prot	c0.06	c0.26		0.03	0.18			c0.39			0.26	
v/s Ratio Perm	0.23			0.18								
v/c Ratio	0.64	0.71		0.52	0.54			0.88			0.58	
Uniform Delay, d1	17.6	27.0		20.6	26.9			25.3			20.8	
Progression Factor	1.00	1.00		1.00	1.00			0.78			0.85	
Incremental Delay, d2	6.2	1.4		3.0	1.4			15.3			2.7	
Delay (s)	23.8	28.4		23.6	28.3			35.1			20.5	
Level of Service	C	C		C	C			D			C	
Approach Delay (s)		27.8			27.8			35.1			20.5	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1115: Ashland Ave. □ W Robinson St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗	↖	↑			↘	↙
Volume (vph)	0	0	0	31	22	9	111	476	16	0	270	60
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	14	12	12	11	12	11	11	11	11	11	11
Total Lost time (s)					4.0	4.0	2.0	4.0			4.0	
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00	
Frbp, ped/bikes					1.00	0.97	1.00	1.00			0.99	
Flpb, ped/bikes					0.98	1.00	0.99	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.97	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1600	1490	1289	1616			1500	
Flt Permitted					0.97	1.00	0.52	1.00			1.00	
Satd. Flow (perm)					1600	1490	707	1616			1500	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	34	24	10	122	523	18	0	297	66
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	58	10	122	541	0	0	363	0
Confl. Peds. (#/hr)			5	5		1	17		6			17
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	9%	0%	27%	7%	6%	3%	13%	8%
Turn Type				Perm	NA	Perm	pm+pt	NA				NA
Protected Phases					8		5	2				6
Permitted Phases				8		8	2					
Actuated Green, G (s)					7.9	7.9	86.1	84.1				71.1
Effective Green, g (s)					7.9	7.9	86.1	84.1				71.1
Actuated g/C Ratio					0.08	0.08	0.86	0.84				0.71
Clearance Time (s)					4.0	4.0	2.0	4.0				4.0
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0
Lane Grp Cap (vph)					126	117	672	1359				1066
v/s Ratio Prot							0.02	c0.33				0.24
v/s Ratio Perm					0.04	0.01	0.14					
v/c Ratio					0.46	0.09	0.18	0.40				0.34
Uniform Delay, d1					44.0	42.7	1.8	1.9				5.5
Progression Factor					1.00	1.00	0.52	0.56				0.34
Incremental Delay, d2					2.7	0.3	0.1	0.8				0.7
Delay (s)					46.7	43.0	1.1	1.9				2.6
Level of Service					D	D	A	A				A
Approach Delay (s)		0.0			46.1			1.7				2.6
Approach LOS		A			D			A				A
Intersection Summary												
HCM 2000 Control Delay			4.8		HCM 2000 Level of Service						A	
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			100.0		Sum of lost time (s)					10.0		
Intersection Capacity Utilization			47.0%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1118: Ashland Ave. □ W 33rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔			↑			↑	
Volume (vph)	52	45	29	0	0	26	0	367	2	0	245	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frbp, ped/bikes	1.00	0.99			0.98			1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00			1.00	
Frt	1.00	0.94			0.86			1.00			1.00	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1706	1675			1279			1010			1343	
Flt Permitted	0.74	1.00			1.00			1.00			1.00	
Satd. Flow (perm)	1326	1675			1279			1010			1343	
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.91	0.92	0.91	0.91	0.93	0.91	0.91
Adj. Flow (vph)	57	49	32	0	0	29	0	403	2	0	269	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	57	81	0	0	29	0	0	405	0	0	269	0
Confl. Peds. (#/hr)	1		3			1			3			3
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	0%	2%	2%	19%	2%	12%	0%	14%	14%	0%
Parking (#/hr)								50				4
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	21.0	21.0			21.0			71.0			71.0	
Effective Green, g (s)	21.0	21.0			21.0			71.0			71.0	
Actuated g/C Ratio	0.21	0.21			0.21			0.71			0.71	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)	278	351			268			717			953	
v/s Ratio Prot		c0.05			0.02			c0.40			0.20	
v/s Ratio Perm	0.04											
v/c Ratio	0.21	0.23			0.11			0.56			0.28	
Uniform Delay, d1	32.6	32.8			31.9			7.0			5.3	
Progression Factor	1.00	1.00			1.00			0.45			0.44	
Incremental Delay, d2	1.7	1.5			0.8			2.7			0.7	
Delay (s)	34.3	34.3			32.7			5.9			3.1	
Level of Service	C	C			C			A			A	
Approach Delay (s)		34.3			32.7			5.9			3.1	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1121: Ashland Ave. □ W 35th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	267	78	37	145	91	0	419	24	0	241	6
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97		1.00	0.95		1.00	0.95
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1588	1514	1216	1588	1370	1108		1139	991		1099	1007
Flt Permitted	0.59	1.00	1.00	0.42	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	989	1514	1216	707	1370	1108		1139	991		1099	1007
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	62	293	86	41	159	100	0	460	26	0	265	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	62	293	86	41	169	90	0	460	26	0	265	7
Confl. Peds. (#/hr)	3		4	4		3			8			10
Confl. Bikes (#/hr)						1			2			3
Heavy Vehicles (%)	0%	11%	14%	0%	15%	19%	14%	13%	4%	17%	14%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								32	32		36	36
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	31.0	31.0	31.0	31.0	31.0	31.0		60.0	60.0		60.0	60.0
Effective Green, g (s)	31.0	31.0	31.0	31.0	31.0	31.0		60.0	60.0		60.0	60.0
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.31	0.31		0.60	0.60		0.60	0.60
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	306	469	376	219	424	343		683	594		659	604
v/s Ratio Prot		c0.19			0.12			c0.40			0.24	
v/s Ratio Perm	0.06		0.07	0.06		0.08			0.03			0.01
v/c Ratio	0.20	0.62	0.23	0.19	0.40	0.26		0.67	0.04		0.40	0.01
Uniform Delay, d1	25.4	29.5	25.6	25.3	27.2	25.9		13.4	8.2		10.5	8.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.53	0.64		0.69	0.74
Incremental Delay, d2	1.5	6.2	1.4	1.9	2.8	1.9		4.4	0.1		1.8	0.0
Delay (s)	26.9	35.7	27.0	27.2	29.9	27.8		11.5	5.4		9.1	6.0
Level of Service	C	D	C	C	C	C		B	A		A	A
Approach Delay (s)		32.8			28.9			11.2			9.0	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1123: Ashland Ave. □ W 37th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	34	34	34	10	21	21	0	553	14	0	426	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		0.99			0.98			1.00			1.00	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.95			0.95			1.00			0.99	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1550			1290			1419			1407	
Flt Permitted		0.88			0.95			1.00			1.00	
Satd. Flow (perm)		1395			1236			1419			1407	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	37	37	37	11	23	23	0	608	15	0	468	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	111	0	0	57	0	0	623	0	0	486	0
Confl. Peds. (#/hr)	10		2	2		10			2			7
Heavy Vehicles (%)	0%	21%	0%	20%	0%	59%	5%	10%	7%	19%	11%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.3			14.3			76.7			76.7	
Effective Green, g (s)		14.3			14.3			76.7			76.7	
Actuated g/C Ratio		0.14			0.14			0.77			0.77	
Clearance Time (s)		4.0			4.0			5.0			5.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		199			176			1088			1079	
v/s Ratio Prot								c0.44			0.35	
v/s Ratio Perm		c0.08			0.05							
v/c Ratio		0.56			0.32			0.57			0.45	
Uniform Delay, d1		39.9			38.5			4.8			4.1	
Progression Factor		1.00			1.00			0.98			0.59	
Incremental Delay, d2		5.7			2.2			1.9			1.3	
Delay (s)		45.6			40.7			6.6			3.8	
Level of Service		D			D			A			A	
Approach Delay (s)		45.6			40.7			6.6			3.8	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1127: Ashland Ave. □ W Pershing Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗		↑	↗		↑	↗
Volume (vph)	28	329	111	108	369	164	0	482	67	0	367	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98		1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1450	2926	1345	1333	2875	992		1294	1134		1253	1106
Flt Permitted	0.51	1.00	1.00	0.38	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	784	2926	1345	527	2875	992		1294	1134		1253	1106
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	31	362	122	119	405	180	0	530	74	0	403	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	31	362	122	119	405	180	0	530	74	0	403	20
Confl. Peds. (#/hr)												2
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	14%	13%	10%	24%	15%	46%	1%	21%	16%	16%	25%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	29.8	26.2	26.2	39.2	32.6	32.6		54.8	54.8		54.8	54.8
Effective Green, g (s)	29.8	26.2	26.2	39.2	32.6	32.6		54.8	54.8		54.8	54.8
Actuated g/C Ratio	0.30	0.26	0.26	0.39	0.33	0.33		0.55	0.55		0.55	0.55
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	257	766	352	287	937	323		709	621		686	606
v/s Ratio Prot	0.00	0.12		c0.04	0.14			c0.41			0.32	
v/s Ratio Perm	0.03		0.09	0.12		c0.18			0.07			0.02
v/c Ratio	0.12	0.47	0.35	0.41	0.43	0.56		0.75	0.12		0.59	0.03
Uniform Delay, d1	25.2	31.1	30.0	20.7	26.4	27.8		17.3	10.9		15.1	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.73	0.70		0.91	0.97
Incremental Delay, d2	0.2	2.1	2.7	1.0	1.5	6.8		6.5	0.4		1.2	0.0
Delay (s)	25.4	33.2	32.6	21.7	27.9	34.5		19.1	8.0		14.9	10.1
Level of Service	C	C	C	C	C	C		B	A		B	B
Approach Delay (s)		32.6			28.5			17.8			14.7	
Approach LOS		C			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.67	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	52.7%	9.0
Analysis Period (min)	15	ICU Level of Service
		A
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 1130: Ashland Ave. □ W 42nd St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	80	33	0	520	308	40
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	12	11	11	11	11
Total Lost time (s)	5.0			3.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.96			1.00	0.98	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1529			1198	1563	
Flt Permitted	0.97			1.00	1.00	
Satd. Flow (perm)	1529			1198	1563	
Peak-hour factor, PHF	0.91	0.91	0.96	0.91	0.91	0.91
Adj. Flow (vph)	88	36	0	571	338	44
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	124	0	0	571	382	0
Confl. Peds. (#/hr)	2	1				4
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	2%	12%	0%	6%	8%	18%
Parking (#/hr)				34		
Turn Type	NA			NA	NA	
Protected Phases	4			2	9	6
Permitted Phases						
Actuated Green, G (s)	14.5			75.5	68.5	
Effective Green, g (s)	14.5			75.5	68.5	
Actuated g/C Ratio	0.14			0.76	0.68	
Clearance Time (s)	5.0				3.0	
Vehicle Extension (s)	8.0				3.0	
Lane Grp Cap (vph)	221			904	1070	
v/s Ratio Prot	c0.08			c0.48	0.24	
v/s Ratio Perm						
v/c Ratio	0.56			0.63	0.36	
Uniform Delay, d1	39.8			5.7	6.6	
Progression Factor	1.00			0.08	0.94	
Incremental Delay, d2	9.2			1.1	0.9	
Delay (s)	49.0			1.6	7.0	
Level of Service	D			A	A	
Approach Delay (s)	49.0			1.6	7.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1131: Ashland Ave. □ W 42nd Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↕	
Volume (vph)	8	2	5	2	3	2	0	589	0	0	497	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	8	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.96			1.00			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1578			1493			1477			1401	
Flt Permitted		0.88			0.95			1.00			1.00	
Satd. Flow (perm)		1436			1441			1477			1401	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	9	2	5	2	3	2	0	647	0	0	546	29
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	16	0	0	7	0	0	647	0	0	575	0
Confl. Peds. (#/hr)									5			13
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	50%	0%	0%	0%	50%	2%	6%	0%	67%	10%	23%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	13
Permitted Phases	4			8								
Actuated Green, G (s)		14.5			14.5			68.5			75.5	
Effective Green, g (s)		14.5			14.5			68.5			75.5	
Actuated g/C Ratio		0.14			0.14			0.68			0.76	
Clearance Time (s)		5.0			5.0			3.0			3.0	
Vehicle Extension (s)		8.0			8.0			3.0			3.0	
Lane Grp Cap (vph)		208			208			1011			1057	
v/s Ratio Prot								c0.44			c0.41	
v/s Ratio Perm		c0.01			0.00							
v/c Ratio		0.08			0.03			0.64			0.54	
Uniform Delay, d1		37.0			36.7			8.8			5.1	
Progression Factor		1.00			1.00			0.75			0.67	
Incremental Delay, d2		0.7			0.3			2.5			0.6	
Delay (s)		37.6			37.0			9.2			4.0	
Level of Service		D			D			A			A	
Approach Delay (s)		37.6			37.0			9.2			4.0	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1132: Ashland Ave. □ W 43rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	248	56	24	115	66	0	459	42	0	277	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	12	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98		1.00	0.98		1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1503	1423		1457	1527	1247		1272	986		1176	886
Flt Permitted	0.68	1.00		0.40	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	1070	1423		616	1527	1247		1272	986		1176	886
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	116	273	62	26	126	73	0	504	46	0	304	80
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	116	335	0	26	126	73	0	504	46	0	304	80
Confl. Peds. (#/hr)	1		14	14		1			1			8
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	6%	16%	4%	8%	10%	12%	3%	4%	10%	22%	8%	15%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								28	28		34	34
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8			2			6
Actuated Green, G (s)	35.0	35.0		35.0	35.0	35.0		56.0	56.0		56.0	56.0
Effective Green, g (s)	35.0	35.0		35.0	35.0	35.0		56.0	56.0		56.0	56.0
Actuated g/C Ratio	0.35	0.35		0.35	0.35	0.35		0.56	0.56		0.56	0.56
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	374	498		215	534	436		712	552		658	496
v/s Ratio Prot		c0.24			0.08			c0.40			0.26	
v/s Ratio Perm	0.11			0.04		0.06			0.05			0.09
v/c Ratio	0.31	0.67		0.12	0.24	0.17		0.71	0.08		0.46	0.16
Uniform Delay, d1	23.7	27.6		22.1	23.0	22.4		16.0	10.2		13.1	10.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.60	0.78		0.49	0.54
Incremental Delay, d2	2.1	7.1		1.1	1.0	0.8		4.7	0.2		2.0	0.6
Delay (s)	25.8	34.7		23.2	24.1	23.3		14.4	8.2		8.4	6.4
Level of Service	C	C		C	C	C		B	A		A	A
Approach Delay (s)		32.4			23.7			13.9			8.0	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1133: Ashland Ave. □ W 44th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Volume (vph)	32	38	15	20	13	9	0	582	43	0	400	39	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11	
Total Lost time (s)		5.0			5.0			4.0			4.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		0.99			0.98			1.00			1.00		
Flpb, ped/bikes		0.97			1.00			1.00			1.00		
Frt		0.98			0.97			0.99			0.99		
Flt Protected		0.98			0.98			1.00			1.00		
Satd. Flow (prot)		1616			1457			1347			1074		
Flt Permitted		0.87			0.82			1.00			1.00		
Satd. Flow (perm)		1437			1221			1347			1074		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91	
Adj. Flow (vph)	35	42	16	22	14	10	0	640	47	0	440	43	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	93	0	0	46	0	0	687	0	0	483	0	
Confl. Peds. (#/hr)	16		2	2		16			2			9	
Heavy Vehicles (%)	0%	5%	7%	10%	0%	44%	14%	5%	2%	10%	10%	10%	
Parking (#/hr)								16			42		
Turn Type	Perm	NA		Perm	NA			NA			NA		
Protected Phases		4			8			2			6		
Permitted Phases	4			8									
Actuated Green, G (s)		10.6			10.6			80.4			80.4		
Effective Green, g (s)		10.6			10.6			80.4			80.4		
Actuated g/C Ratio		0.11			0.11			0.80			0.80		
Clearance Time (s)		5.0			5.0			4.0			4.0		
Vehicle Extension (s)		5.0			5.0			3.0			3.0		
Lane Grp Cap (vph)		152			129			1082			863		
v/s Ratio Prot								c0.51			0.45		
v/s Ratio Perm		c0.06			0.04								
v/c Ratio		0.61			0.36			0.63			0.56		
Uniform Delay, d1		42.7			41.5			3.9			3.5		
Progression Factor		1.00			1.00			0.24			0.67		
Incremental Delay, d2		10.1			3.5			2.3			2.5		
Delay (s)		52.8			45.0			3.3			4.8		
Level of Service		D			D			A			A		
Approach Delay (s)		52.8			45.0			3.3			4.8		
Approach LOS		D			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			8.8									HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	9.0
Intersection Capacity Utilization			48.4%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1134: Ashland Ave. □ W 45th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	36	20	15	16	10	22	0	489	23	0	275	43
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.98			1.00			0.99	
Flpb, ped/bikes		0.98			0.99			1.00			1.00	
Frt		0.97			0.94			0.99			0.98	
Flt Protected		0.97			0.98			1.00			1.00	
Satd. Flow (prot)		1642			1548			1141			1085	
Flt Permitted		0.85			0.91			1.00			1.00	
Satd. Flow (perm)		1423			1429			1141			1085	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	40	22	16	18	11	24	0	537	25	0	302	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	78	0	0	53	0	0	562	0	0	349	0
Confl. Peds. (#/hr)	15		10	10			15		7			9
Confl. Bikes (#/hr)							1					1
Heavy Vehicles (%)	0%	0%	7%	12%	0%	0%	10%	6%	4%	0%	11%	0%
Parking (#/hr)								40			40	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		23.0			23.0			68.0			68.0	
Effective Green, g (s)		23.0			23.0			68.0			68.0	
Actuated g/C Ratio		0.23			0.23			0.68			0.68	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		327			328			775			737	
v/s Ratio Prot								c0.49			0.32	
v/s Ratio Perm		c0.05			0.04							
v/c Ratio		0.24			0.16			0.73			0.47	
Uniform Delay, d1		31.4			30.8			10.1			7.6	
Progression Factor		1.00			1.00			0.57			1.01	
Incremental Delay, d2		1.7			1.1			4.7			1.9	
Delay (s)		33.1			31.8			10.5			9.5	
Level of Service		C			C			B			A	
Approach Delay (s)		33.1			31.8			10.5			9.5	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1135: Ashland Ave. □ W 46th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	32	52	10	4	14	38	0	473	27	0	251	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.96			0.99			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.99			0.91			0.99			0.98	
Flt Protected		0.98			1.00			1.00			1.00	
Satd. Flow (prot)		1703			1516			1152			995	
Flt Permitted		0.89			0.99			1.00			1.00	
Satd. Flow (perm)		1549			1501			1152			995	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	35	57	11	4	15	42	0	520	30	0	276	45
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	103	0	0	61	0	0	550	0	0	321	0
Confl. Peds. (#/hr)	13		5	5		13			18			11
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	10%	0%	0%	5%	0%	6%	4%	2%	13%	7%
Parking (#/hr)								38			48	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		20.0			20.0			72.0			72.0	
Effective Green, g (s)		20.0			20.0			72.0			72.0	
Actuated g/C Ratio		0.20			0.20			0.72			0.72	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		309			300			829			716	
v/s Ratio Prot								c0.48			0.32	
v/s Ratio Perm		c0.07			0.04							
v/c Ratio		0.33			0.20			0.66			0.45	
Uniform Delay, d1		34.3			33.4			7.5			5.8	
Progression Factor		1.00			1.00			0.63			1.05	
Incremental Delay, d2		2.9			1.5			3.4			1.8	
Delay (s)		37.2			34.9			8.1			7.9	
Level of Service		D			C			A			A	
Approach Delay (s)		37.2			34.9			8.1			7.9	
Approach LOS		D			C			A			A	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1136: Ashland Ave. □ W 47th St. □ S. McDowell Ave.

8/8/2013



Movement	EBL2	EBT	EBR	WBL	WBT	WBR	WBR2	NBT	NBR	NBR2	SBT	SBR
Lane Configurations	↗	↕		↖	↕			↕	↖		↕	↗
Volume (vph)	100	293	40	60	256	48	7	361	0	72	192	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	11	11	11
Total Lost time (s)	3.0	5.0		3.0	5.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.93		1.00	0.92
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1425	2701		1527	2712			1071	1328		1398	1126
Flt Permitted	0.45	1.00		0.51	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	670	2701		812	2712			1071	1328		1398	1126
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	110	322	44	66	281	53	8	397	0	79	211	65
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	110	366	0	66	342	0	0	397	79	0	211	65
Confl. Peds. (#/hr)			27	27		51				33		44
Heavy Vehicles (%)	12%	16%	8%	3%	12%	15%	0%	4%	0%	4%	12%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								52			0	0
Turn Type	pm+pt	NA		pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	35.7	28.8		31.5	26.7			54.4	54.4		54.4	54.4
Effective Green, g (s)	35.7	28.8		31.5	26.7			54.4	54.4		54.4	54.4
Actuated g/C Ratio	0.36	0.29		0.32	0.27			0.54	0.54		0.54	0.54
Clearance Time (s)	3.0	5.0		3.0	5.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	291	777		290	724			582	722		760	612
v/s Ratio Prot	c0.03	c0.14		0.01	0.13			c0.37			0.15	
v/s Ratio Perm	0.11			0.06					0.06			0.06
v/c Ratio	0.38	0.47		0.23	0.47			0.68	0.11		0.28	0.11
Uniform Delay, d1	22.6	29.3		24.5	30.7			16.5	11.1		12.2	11.0
Progression Factor	1.00	1.00		1.00	1.00			0.41	0.29		0.60	0.67
Incremental Delay, d2	0.8	2.0		0.4	2.2			4.0	0.2		0.8	0.3
Delay (s)	23.4	31.4		24.9	32.9			10.8	3.4		8.2	7.7
Level of Service	C	C		C	C			B	A		A	A
Approach Delay (s)		29.5			31.7			9.6			8.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	SWR2
Lane Configurations	7
Volume (vph)	3
Ideal Flow (vphpl)	1800
Lane Width	12
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frbp, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1557
Flt Permitted	1.00
Satd. Flow (perm)	1557
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	3
RTOR Reduction (vph)	0
Lane Group Flow (vph)	3
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	0%
Bus Blockages (#/hr)	0
Parking (#/hr)	
Turn Type	custom
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	26.7
Effective Green, g (s)	26.7
Actuated g/C Ratio	0.27
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	415
v/s Ratio Prot	
v/s Ratio Perm	0.00
v/c Ratio	0.01
Uniform Delay, d1	26.9
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	26.9
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

1137: Ashland Ave. □ W 48th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕			↑			↕		
Volume (vph)	0	0	0	16	55	16	0	582	0	0	250	52	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11	
Total Lost time (s)					5.0			4.0			4.0		
Lane Util. Factor					1.00			1.00			1.00		
Frb, ped/bikes					0.98			1.00			0.98		
Flpb, ped/bikes					0.98			1.00			1.00		
Frt					0.97			1.00			0.98		
Flt Protected					0.99			1.00			1.00		
Satd. Flow (prot)					1594			1205			1014		
Flt Permitted					0.99			1.00			1.00		
Satd. Flow (perm)					1594			1205			1014		
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	18	60	18	0	640	0	0	275	57	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	96	0	0	640	0	0	332	0	
Confl. Peds. (#/hr)				56	56		33			2		19	
Confl. Bikes (#/hr)												2	
Heavy Vehicles (%)	0%	0%	0%	0%	4%	12%	9%	4%	0%	0%	7%	8%	
Parking (#/hr)								36			50		
Turn Type				Perm	NA			NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8									
Actuated Green, G (s)					23.0			68.0			68.0		
Effective Green, g (s)					23.0			68.0			68.0		
Actuated g/C Ratio					0.23			0.68			0.68		
Clearance Time (s)					5.0			4.0			4.0		
Lane Grp Cap (vph)					366			819			689		
v/s Ratio Prot								c0.53			0.33		
v/s Ratio Perm					0.06								
v/c Ratio					0.26			0.78			0.48		
Uniform Delay, d1					31.5			10.9			7.6		
Progression Factor					1.00			0.76			0.65		
Incremental Delay, d2					1.7			6.5			2.3		
Delay (s)					33.3			14.8			7.3		
Level of Service					C			B			A		
Approach Delay (s)		0.0			33.3			14.8			7.3		
Approach LOS		A			C			B			A		
Intersection Summary													
HCM 2000 Control Delay			14.2									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.65										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	9.0
Intersection Capacity Utilization			59.0%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1138: Ashland Ave. □ W 49th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	48	40	30	16	19	10	0	410	37	0	197	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.99			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.97			0.97			0.99			0.99	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1697			1634			1112			1029	
Flt Permitted		0.86			0.89			1.00			1.00	
Satd. Flow (perm)		1496			1481			1112			1029	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	53	44	33	18	21	11	0	451	41	0	216	23
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	130	0	0	50	0	0	492	0	0	239	0
Confl. Peds. (#/hr)	5						5			14		4
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	12%	0%	0%	0%	5%	0%	0%	9%	0%
Parking (#/hr)								44			50	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			67.0			67.0	
Effective Green, g (s)		24.0			24.0			67.0			67.0	
Actuated g/C Ratio		0.24			0.24			0.67			0.67	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		359			355			745			689	
v/s Ratio Prot								c0.44			0.23	
v/s Ratio Perm		c0.09			0.03							
v/c Ratio		0.36			0.14			0.66			0.35	
Uniform Delay, d1		31.6			29.9			9.8			7.1	
Progression Factor		1.00			1.00			0.59			0.34	
Incremental Delay, d2		2.8			0.8			3.6			1.2	
Delay (s)		34.4			30.7			9.3			3.7	
Level of Service		C			C			A			A	
Approach Delay (s)		34.4			30.7			9.3			3.7	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1139: Ashland Ave. □ W 50th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	26	34	8	16	18	26	0	450	15	0	211	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.97			1.00			0.99	
Flpb, ped/bikes		0.99			0.99			1.00			1.00	
Frt		0.98			0.94			1.00			0.98	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1697			1607			1112			1387	
Flt Permitted		0.88			0.93			1.00			1.00	
Satd. Flow (perm)		1529			1507			1112			1387	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	29	37	9	18	20	29	0	495	16	0	232	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	75	0	0	67	0	0	511	0	0	262	0
Confl. Peds. (#/hr)	19		26	26		19			8			8
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	12%	0%
Parking (#/hr)								44			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		23.0			23.0			68.0			68.0	
Effective Green, g (s)		23.0			23.0			68.0			68.0	
Actuated g/C Ratio		0.23			0.23			0.68			0.68	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		351			346			756			943	
v/s Ratio Prot								c0.46			0.19	
v/s Ratio Perm		c0.05			0.04							
v/c Ratio		0.21			0.19			0.68			0.28	
Uniform Delay, d1		31.2			31.0			9.5			6.3	
Progression Factor		1.00			1.00			0.42			0.55	
Incremental Delay, d2		1.4			1.2			4.2			0.7	
Delay (s)		32.6			32.3			8.1			4.2	
Level of Service		C			C			A			A	
Approach Delay (s)		32.6			32.3			8.1			4.2	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1140: Ashland Ave. □ W 51st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↑	↗		↑	↗
Volume (vph)	112	318	29	46	196	55	0	349	40	0	168	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.96		1.00	0.94		1.00	0.97
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1519	1556	1259	1510	1585	1287		1154	926		983	867
Flt Permitted	0.56	1.00	1.00	0.40	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	901	1556	1259	636	1585	1287		1154	926		983	867
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	123	349	32	51	215	60	0	384	44	0	185	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	123	349	32	51	215	60	0	384	44	0	185	38
Confl. Peds. (#/hr)	5		12	12		5			14			4
Heavy Vehicles (%)	4%	8%	7%	4%	6%	7%	3%	4%	2%	8%	15%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								42	42		50	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	37.0	37.0	37.0	37.0	37.0	37.0		54.0	54.0		54.0	54.0
Effective Green, g (s)	37.0	37.0	37.0	37.0	37.0	37.0		54.0	54.0		54.0	54.0
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37		0.54	0.54		0.54	0.54
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	333	575	465	235	586	476		623	500		530	468
v/s Ratio Prot		c0.22			0.14			c0.33			0.19	
v/s Ratio Perm	0.14		0.03	0.08		0.05			0.05			0.04
v/c Ratio	0.37	0.61	0.07	0.22	0.37	0.13		0.62	0.09		0.35	0.08
Uniform Delay, d1	23.0	25.6	20.4	21.6	23.0	20.8		15.9	11.1		13.0	11.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.17	0.27		0.72	0.70
Incremental Delay, d2	3.1	4.7	0.3	2.1	1.8	0.5		3.7	0.3		1.8	0.3
Delay (s)	26.1	30.3	20.6	23.7	24.7	21.4		6.4	3.3		11.1	8.1
Level of Service	C	C	C	C	C	C		A	A		B	A
Approach Delay (s)		28.7			23.9			6.1			10.6	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1142: Ashland Ave. □ W 53rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↑			↑	
Volume (vph)	0	0	0	8	9	13	0	451	0	0	196	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	11	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)					5.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frbp, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					0.99			1.00			1.00	
Frt					0.94			1.00			0.99	
Flt Protected					0.99			1.00			1.00	
Satd. Flow (prot)					1590			1205			1021	
Flt Permitted					0.99			1.00			1.00	
Satd. Flow (perm)					1590			1205			1021	
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Adj. Flow (vph)	0	0	0	9	10	14	0	496	0	0	215	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	33	0	0	496	0	0	233	0
Confl. Peds. (#/hr)			13	13		2			13			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	8%	0%	4%	0%	20%	11%	12%
Parking (#/hr)								36			48	
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					23.0			68.0			68.0	
Effective Green, g (s)					23.0			68.0			68.0	
Actuated g/C Ratio					0.23			0.68			0.68	
Clearance Time (s)					5.0			4.0			4.0	
Lane Grp Cap (vph)					365			819			694	
v/s Ratio Prot								c0.41			0.23	
v/s Ratio Perm					0.02							
v/c Ratio					0.09			0.61			0.34	
Uniform Delay, d1					30.3			8.7			6.6	
Progression Factor					1.00			0.23			0.71	
Incremental Delay, d2					0.5			2.7			1.3	
Delay (s)					30.8			4.8			6.0	
Level of Service					C			A			A	
Approach Delay (s)		0.0			30.8			4.8			6.0	
Approach LOS		A			C			A			A	

Intersection Summary

HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1144: Ashland Ave. □ W Garfield Blvd. (WB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕	↗		↕			↕	↗
Volume (vph)	0	0	0	138	738	29	0	427	0	0	152	70
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	9	10	10	11	11	11	11	11	11
Total Lost time (s)				5.0	5.0	5.0		3.0			3.0	3.0
Lane Util. Factor				1.00	0.95	1.00		1.00			1.00	1.00
Frbp, ped/bikes				1.00	1.00	0.89		1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00		1.00			1.00	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				1524	3069	1266		1477			1084	970
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				1524	3069	1266		1477			1084	970
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	152	811	32	0	469	0	0	167	77
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	152	811	32	0	469	0	0	167	77
Confl. Peds. (#/hr)						57			12			14
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	1%	4%	0%	4%	6%	0%	0%	14%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								0			38	38
Turn Type				Perm	NA	Perm		NA			NA	Perm
Protected Phases					8			2 5			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				40.0	40.0	40.0		46.0			43.0	43.0
Effective Green, g (s)				40.0	40.0	40.0		46.0			43.0	43.0
Actuated g/C Ratio				0.40	0.40	0.40		0.46			0.43	0.43
Clearance Time (s)				5.0	5.0	5.0					3.0	3.0
Lane Grp Cap (vph)				609	1227	506		679			466	417
v/s Ratio Prot					c0.26			c0.32			0.15	
v/s Ratio Perm				0.10		0.03						0.08
v/c Ratio				0.25	0.66	0.06		0.69			0.36	0.18
Uniform Delay, d1				20.0	24.5	18.5		21.4			19.2	17.6
Progression Factor				1.00	1.00	1.00		0.38			1.09	1.11
Incremental Delay, d2				1.0	2.8	0.2		4.2			2.1	1.0
Delay (s)				21.0	27.3	18.7		12.3			23.0	20.5
Level of Service				C	C	B		B			C	C
Approach Delay (s)		0.0			26.0			12.3			22.2	
Approach LOS		A			C			B			C	

Intersection Summary

HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1145: Ashland Ave. □ W Garfield Blvd. (EB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗					↑	↗		↑	
Volume (vph)	76	936	63	0	0	0	0	376	164	0	254	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0					3.0	3.0		5.0	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00	0.90					1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	1.00	0.85					1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1477	3011	1191					1248	1077		1437	
Flt Permitted	0.95	1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1477	3011	1191					1248	1077		1437	
Peak-hour factor, PHF	0.91	0.91	0.91	0.94	0.94	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	84	1029	69	0	0	0	0	413	180	0	279	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	84	1029	69	0	0	0	0	413	180	0	279	0
Confl. Peds. (#/hr)	1		48				1		10			6
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	6%	8%	0%	0%	0%	0%	6%	2%	4%	9%	0%
Parking (#/hr)								28	28		0	
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			1	6
Permitted Phases	4		4						2			
Actuated Green, G (s)	40.0	40.0	40.0					42.0	42.0		48.0	
Effective Green, g (s)	40.0	40.0	40.0					42.0	42.0		48.0	
Actuated g/C Ratio	0.40	0.40	0.40					0.42	0.42		0.48	
Clearance Time (s)	5.0	5.0	5.0					3.0	3.0			
Lane Grp Cap (vph)	590	1204	476					524	452		689	
v/s Ratio Prot		c0.34						c0.33			c0.19	
v/s Ratio Perm	0.06		0.06						0.17			
v/c Ratio	0.14	0.85	0.14					0.79	0.40		0.40	
Uniform Delay, d1	19.1	27.3	19.1					25.1	20.2		16.8	
Progression Factor	1.00	1.00	1.00					0.92	0.99		1.21	
Incremental Delay, d2	0.5	7.8	0.6					7.5	1.7		1.7	
Delay (s)	19.6	35.2	19.7					30.6	21.8		22.0	
Level of Service	B	D	B					C	C		C	
Approach Delay (s)		33.2			0.0			27.9			22.0	
Approach LOS		C			A			C			C	

Intersection Summary

HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1148: Ashland Ave. □ W 57th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	22	10	34	0	0	0	0	592	8	0	261	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.97						1.00			1.00	
Flpb, ped/bikes		0.99						1.00			1.00	
Frt		0.93						1.00			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		1544						1167			1063	
Flt Permitted		0.98						1.00			1.00	
Satd. Flow (perm)		1544						1167			1063	
Peak-hour factor, PHF	0.91	0.91	0.91	0.95	0.95	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	24	11	37	0	0	0	0	651	9	0	287	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	72	0	0	0	0	0	660	0	0	287	0
Confl. Peds. (#/hr)	7		17				7		10			23
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	4%	12%	0%	8%	0%
Parking (#/hr)								40			48	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						68.0			68.0	
Effective Green, g (s)		23.0						68.0			68.0	
Actuated g/C Ratio		0.23						0.68			0.68	
Clearance Time (s)		5.0						4.0			4.0	
Lane Grp Cap (vph)		355						793			722	
v/s Ratio Prot								c0.57			0.27	
v/s Ratio Perm		0.05										
v/c Ratio		0.20						0.83			0.40	
Uniform Delay, d1		31.1						11.8			7.0	
Progression Factor		1.00						0.37			0.92	
Incremental Delay, d2		1.3						7.4			1.5	
Delay (s)		32.4						11.8			8.0	
Level of Service		C						B			A	
Approach Delay (s)		32.4			0.0			11.8			8.0	
Approach LOS		C			A			B			A	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1150: Ashland Ave. □ W 59th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	302	39	51	273	37	0	505	33	0	245	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.79	1.00	1.00	0.96		1.00	0.98		1.00	0.90
Flpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1432	1527	1070	1493	1615	1266		1288	1099		1437	1089
Flt Permitted	0.41	1.00	1.00	0.36	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	617	1527	1070	573	1615	1266		1288	1099		1437	1089
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	84	332	43	56	300	41	0	555	36	0	269	36
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	84	332	43	56	300	41	0	555	36	0	269	36
Confl. Peds. (#/hr)	7		63	63		7			1			25
Confl. Bikes (#/hr)						1						1
Heavy Vehicles (%)	11%	10%	5%	4%	4%	8%	2%	4%	0%	7%	9%	9%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								26	26		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	34.6	30.6	30.6	34.6	30.6	30.6		53.4	53.4		53.4	53.4
Effective Green, g (s)	34.6	30.6	30.6	34.6	30.6	30.6		53.4	53.4		53.4	53.4
Actuated g/C Ratio	0.35	0.31	0.31	0.35	0.31	0.31		0.53	0.53		0.53	0.53
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	246	467	327	235	494	387		687	586		767	581
v/s Ratio Prot	c0.01	c0.22		0.01	0.19			c0.43			0.19	
v/s Ratio Perm	0.10		0.04	0.07		0.03			0.03			0.03
v/c Ratio	0.34	0.71	0.13	0.24	0.61	0.11		0.81	0.06		0.35	0.06
Uniform Delay, d1	23.3	30.8	25.1	22.8	29.6	24.9		19.1	11.2		13.4	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.65	0.92		0.63	0.68
Incremental Delay, d2	0.8	8.9	0.8	0.5	5.5	0.6		6.1	0.1		1.2	0.2
Delay (s)	24.1	39.7	25.9	23.4	35.0	25.4		18.4	10.4		9.6	7.9
Level of Service	C	D	C	C	D	C		B	B		A	A
Approach Delay (s)		35.5			32.4			18.0			9.4	
Approach LOS		D			C			B			A	

Intersection Summary		
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.75	C
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	59.0%	12.0
Analysis Period (min)	15	ICU Level of Service
		B
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

1152: Ashland Ave. □ W 61st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	32	32	85	0	0	0	0	572	45	0	309	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	16	16	16	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.98						0.99			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.92						0.99			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1749						1232			1015	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1749						1232			1015	
Peak-hour factor, PHF	0.91	0.91	0.91	0.99	0.99	0.91	0.99	0.91	0.91	0.99	0.91	0.91
Adj. Flow (vph)	35	35	93	0	0	0	0	629	49	0	340	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	163	0	0	0	0	0	678	0	0	340	0
Confl. Peds. (#/hr)	6		7				6		16			24
Heavy Vehicles (%)	19%	0%	0%	0%	0%	0%	0%	3%	2%	14%	8%	0%
Parking (#/hr)								32			54	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						68.0			68.0	
Effective Green, g (s)		23.0						68.0			68.0	
Actuated g/C Ratio		0.23						0.68			0.68	
Clearance Time (s)		5.0						4.0			4.0	
Lane Grp Cap (vph)		402						837			690	
v/s Ratio Prot								c0.55			0.33	
v/s Ratio Perm		0.09										
v/c Ratio		0.41						0.81			0.49	
Uniform Delay, d1		32.7						11.4			7.7	
Progression Factor		1.00						1.00			0.93	
Incremental Delay, d2		3.0						8.4			2.4	
Delay (s)		35.7						19.8			9.6	
Level of Service		D						B			A	
Approach Delay (s)		35.7			0.0			19.8			9.6	
Approach LOS		D			A			B			A	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1154: Ashland Ave. □ W 63rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗			↑	↗		↑	↗
Volume (vph)	59	493	83	71	462	44	0	475	60	0	311	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	10	10	10	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0			2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.90	1.00	1.00			1.00	0.90		1.00	0.91
Flpb, ped/bikes	0.99	1.00	1.00	0.97	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1488	1527	1178	1457	1580			1673	1145		1626	1208
Flt Permitted	0.31	1.00	1.00	0.32	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	479	1527	1178	488	1580			1673	1145		1626	1208
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.92	0.91	0.91
Adj. Flow (vph)	65	542	91	78	508	48	0	522	66	0	342	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	65	542	91	78	556	0	0	522	66	0	342	49
Confl. Peds. (#/hr)	19		76	76		19			42			37
Heavy Vehicles (%)	14%	10%	9%	6%	5%	0%	5%	4%	3%	2%	7%	11%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)									0			
Turn Type	Perm	NA	Perm	Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	31.0	31.0	31.0	31.0	31.0			27.0	27.0		27.0	27.0
Effective Green, g (s)	31.0	31.0	31.0	31.0	31.0			27.0	27.0		27.0	27.0
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.48			0.42	0.42		0.42	0.42
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	228	728	561	232	753			694	475		675	501
v/s Ratio Prot		c0.35			0.35			c0.31			0.21	
v/s Ratio Perm	0.14		0.08	0.16					0.06			0.04
v/c Ratio	0.29	0.74	0.16	0.34	0.74			0.75	0.14		0.51	0.10
Uniform Delay, d1	10.3	13.8	9.6	10.6	13.7			16.2	11.8		14.1	11.6
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.78	0.69		1.00	1.00
Incremental Delay, d2	3.1	6.8	0.6	3.9	6.4			6.1	0.5		2.7	0.4
Delay (s)	13.4	20.6	10.3	14.5	20.1			18.8	8.6		16.8	12.0
Level of Service	B	C	B	B	C			B	A		B	B
Approach Delay (s)		18.6			19.4			17.7			16.2	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1156: Ashland Ave. □ W 65th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕			↑			↕		
Volume (vph)	0	0	0	36	14	56	0	612	0	0	246	25	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11	
Total Lost time (s)					5.0			4.0			4.0		
Lane Util. Factor					1.00			1.00			1.00		
Frbp, ped/bikes					0.98			1.00			0.99		
Flpb, ped/bikes					0.97			1.00			1.00		
Frt					0.93			1.00			0.99		
Flt Protected					0.98			1.00			1.00		
Satd. Flow (prot)					1710			1422			1141		
Flt Permitted					0.98			1.00			1.00		
Satd. Flow (perm)					1710			1422			1141		
Peak-hour factor, PHF	0.95	0.95	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91	
Adj. Flow (vph)	0	0	0	40	15	62	0	673	0	0	270	27	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	117	0	0	673	0	0	297	0	
Confl. Peds. (#/hr)			22	22		6			27			26	
Heavy Vehicles (%)	0%	0%	0%	6%	0%	2%	0%	4%	0%	0%	8%	4%	
Parking (#/hr)								10			36		
Turn Type				Perm	NA			NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8									
Actuated Green, G (s)					8.0			48.0			48.0		
Effective Green, g (s)					8.0			48.0			48.0		
Actuated g/C Ratio					0.12			0.74			0.74		
Clearance Time (s)					5.0			4.0			4.0		
Vehicle Extension (s)					5.0			3.0			3.0		
Lane Grp Cap (vph)					210			1050			842		
v/s Ratio Prot								c0.47			0.26		
v/s Ratio Perm					0.07								
v/c Ratio					0.56			0.64			0.35		
Uniform Delay, d1					26.8			4.2			3.0		
Progression Factor					1.00			1.00			0.27		
Incremental Delay, d2					5.4			3.0			1.1		
Delay (s)					32.2			7.2			1.9		
Level of Service					C			A			A		
Approach Delay (s)		0.0			32.2			7.2			1.9		
Approach LOS		A			C			A			A		
Intersection Summary													
HCM 2000 Control Delay			8.5		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			65.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			48.3%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1158: Ashland Ave. □ W Marquette Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	94	360	40	66	260	63	0	479	25	0	247	25
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	9	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96		1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99			0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1532	1663	1373	1490	1631	1349		1223			1082	
Flt Permitted	0.47	1.00	1.00	0.33	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	751	1663	1373	511	1631	1349		1223			1082	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.98	0.91	0.91	0.98	0.91	0.91
Adj. Flow (vph)	103	396	44	73	286	69	0	526	27	0	271	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	103	396	44	73	286	69	0	553	0	0	298	0
Confl. Peds. (#/hr)	11		12	12		11			20			18
Heavy Vehicles (%)	0%	1%	0%	3%	3%	2%	0%	0%	0%	10%	7%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								38	38		44	44
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	34.6	30.6	30.6	34.6	30.6	30.6		42.4			42.4	
Effective Green, g (s)	34.6	30.6	30.6	34.6	30.6	30.6		42.4			42.4	
Actuated g/C Ratio	0.38	0.34	0.34	0.38	0.34	0.34		0.47			0.47	
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0			5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	323	565	466	239	554	458		576			509	
v/s Ratio Prot	c0.01	c0.24		0.01	0.18			c0.45			0.28	
v/s Ratio Perm	0.11		0.03	0.10		0.05						
v/c Ratio	0.32	0.70	0.09	0.31	0.52	0.15		0.96			0.59	
Uniform Delay, d1	18.5	25.7	20.3	18.8	23.8	20.7		23.0			17.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.77			1.00	
Incremental Delay, d2	0.6	7.1	0.4	0.7	3.4	0.7		23.4			4.9	
Delay (s)	19.1	32.8	20.7	19.5	27.2	21.4		41.1			22.2	
Level of Service	B	C	C	B	C	C		D			C	
Approach Delay (s)		29.2			24.9			41.1			22.2	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1160: Ashland Ave. □ W 69th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕	↕		↕	↕
Volume (vph)	76	357	49	44	197	30	0	439	41	0	275	51
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes		0.99			1.00	0.89		1.00	0.91		1.00	0.90
Flpb, ped/bikes		0.99			0.99	1.00		1.00	1.00		1.00	1.00
Frt		0.98			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			0.99	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)		3032			1595	1283		1138	1324		1018	1252
Flt Permitted		0.78			0.82	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)		2374			1312	1283		1138	1324		1018	1252
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	84	392	54	48	216	33	0	482	45	0	302	56
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	530	0	0	264	33	0	482	45	0	302	56
Confl. Peds. (#/hr)	47		48	48		47			48			32
Heavy Vehicles (%)	0%	6%	0%	0%	9%	3%	6%	4%	2%	4%	6%	6%
Parking (#/hr)								44			56	
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8			2			6
Actuated Green, G (s)		28.0			28.0	28.0		53.0	53.0		53.0	53.0
Effective Green, g (s)		28.0			28.0	28.0		53.0	53.0		53.0	53.0
Actuated g/C Ratio		0.31			0.31	0.31		0.59	0.59		0.59	0.59
Clearance Time (s)		5.0			5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)		738			408	399		670	779		599	737
v/s Ratio Prot								c0.42			0.30	
v/s Ratio Perm		c0.22			0.20	0.03			0.03			0.04
v/c Ratio		0.72			0.65	0.08		0.72	0.06		0.50	0.08
Uniform Delay, d1		27.5			26.7	21.9		13.2	7.9		10.8	8.0
Progression Factor		1.00			1.00	1.00		0.67	0.96		0.58	0.41
Incremental Delay, d2		5.9			7.7	0.4		4.8	0.1		2.8	0.2
Delay (s)		33.4			34.5	22.3		13.6	7.7		9.1	3.4
Level of Service		C			C	C		B	A		A	A
Approach Delay (s)		33.4			33.1			13.1			8.2	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1162: Ashland Ave. □ W 71st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	326	32	40	322	65	0	526	13	0	263	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0			4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.94		1.00			1.00	
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00			0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1586	1647	1316	1512	1615	1315		1413			1468	
Flt Permitted	0.34	1.00	1.00	0.37	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	568	1647	1316	590	1615	1315		1413			1468	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	80	358	35	44	354	71	0	578	14	0	289	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	80	358	35	44	354	71	0	592	0	0	319	0
Confl. Peds. (#/hr)	24		18	18		24			7			8
Heavy Vehicles (%)	0%	2%	3%	5%	4%	2%	8%	4%	15%	7%	5%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								10	10		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	33.2	29.2	29.2	31.2	28.2	28.2		45.8			45.8	
Effective Green, g (s)	33.2	29.2	29.2	31.2	28.2	28.2		45.8			45.8	
Actuated g/C Ratio	0.37	0.32	0.32	0.35	0.31	0.31		0.51			0.51	
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	254	534	426	235	506	412		719			747	
v/s Ratio Prot	c0.01	0.22		0.01	c0.22			c0.42			0.22	
v/s Ratio Perm	0.10		0.03	0.06		0.05						
v/c Ratio	0.31	0.67	0.08	0.19	0.70	0.17		0.82			0.43	
Uniform Delay, d1	19.6	26.2	21.1	20.3	27.2	22.4		18.7			13.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.40			1.28	
Incremental Delay, d2	0.7	6.6	0.4	0.4	7.8	0.9		8.7			1.5	
Delay (s)	20.3	32.8	21.5	20.7	35.0	23.3		16.2			19.2	
Level of Service	C	C	C	C	D	C		B			B	
Approach Delay (s)		29.9			31.9			16.2			19.2	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1168: Ashland Ave. □ W 74th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗		↑	↗		↑	↗
Volume (vph)	51	204	29	29	136	39	0	492	15	0	319	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes		1.00	0.92		1.00	0.97		1.00	0.91		1.00	0.92
Flpb, ped/bikes		1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)		1575	1122		1577	1233		1506	1252		1477	1254
Flt Permitted		0.90	1.00		0.91	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)		1438	1122		1449	1233		1506	1252		1477	1254
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.97	0.91	0.91	0.97	0.91	0.91
Adj. Flow (vph)	56	224	32	32	149	43	0	541	16	0	351	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	280	32	0	181	43	0	541	16	0	351	24
Confl. Peds. (#/hr)	7		33	33		7			27			20
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	22%	6%	17%	0%	6%	12%	9%	4%	7%	5%	6%	9%
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		31.0	31.0		31.0	31.0		50.0	50.0		50.0	50.0
Effective Green, g (s)		31.0	31.0		31.0	31.0		50.0	50.0		50.0	50.0
Actuated g/C Ratio		0.34	0.34		0.34	0.34		0.56	0.56		0.56	0.56
Clearance Time (s)		5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)		495	386		499	424		836	695		820	696
v/s Ratio Prot								c0.36			0.24	
v/s Ratio Perm		c0.19	0.03		0.12	0.03			0.01			0.02
v/c Ratio		0.57	0.08		0.36	0.10		0.65	0.02		0.43	0.03
Uniform Delay, d1		24.0	19.9		22.1	20.0		13.9	9.0		11.7	9.1
Progression Factor		1.00	1.00		1.00	1.00		0.83	0.68		0.68	0.60
Incremental Delay, d2		4.6	0.4		2.0	0.5		2.7	0.0		1.6	0.1
Delay (s)		28.6	20.3		24.1	20.5		14.1	6.2		9.5	5.6
Level of Service		C	C		C	C		B	A		A	A
Approach Delay (s)		27.8			23.4			13.9			9.3	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1170: Ashland Ave. □ W 76th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	46	309	17	44	208	53	0	518	39	0	206	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3060			3009			1257			1150	
Flt Permitted		0.86			0.83			1.00			1.00	
Satd. Flow (perm)		2647			2526			1257			1150	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	51	340	19	48	229	58	0	569	43	0	226	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	410	0	0	335	0	0	612	0	0	237	0
Confl. Peds. (#/hr)	1		9	9		1			5			2
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	3%	6%	0%	2%	4%	0%	4%	5%	7%	7%	0%
Parking (#/hr)								28			38	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			57.0			57.0	
Effective Green, g (s)		24.0			24.0			57.0			57.0	
Actuated g/C Ratio		0.27			0.27			0.63			0.63	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		705			673			796			728	
v/s Ratio Prot								c0.49			0.21	
v/s Ratio Perm		c0.15			0.13							
v/c Ratio		0.58			0.50			0.77			0.33	
Uniform Delay, d1		28.6			27.9			11.8			7.6	
Progression Factor		1.00			1.00			0.61			1.18	
Incremental Delay, d2		3.5			2.6			5.2			1.1	
Delay (s)		32.1			30.5			12.4			10.1	
Level of Service		C			C			B			B	
Approach Delay (s)		32.1			30.5			12.4			10.1	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1173: Ashland Ave. □ W 79th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	496	42	36	454	72	0	412	35	0	233	27
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	9	9	10	9	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.90	1.00	1.00	0.92		1.00	0.88		1.00	0.87
Flpb, ped/bikes	0.98	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1489	1541	1178	1413	1527	1159		1165	890		1143	820
Flt Permitted	0.26	1.00	1.00	0.21	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	407	1541	1178	316	1527	1159		1165	890		1143	820
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	122	545	46	40	499	79	0	453	38	0	256	30
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	122	545	46	40	499	79	0	453	38	0	256	30
Confl. Peds. (#/hr)	41		54	54		41			41			47
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	1%	9%	5%	6%	10%	9%	7%	6%	3%	10%	5%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								38	38		42	42
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	35.0	35.0	35.0	35.0	35.0	35.0		39.0	39.0		39.0	39.0
Effective Green, g (s)	35.0	35.0	35.0	35.0	35.0	35.0		39.0	39.0		39.0	39.0
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.43	0.43		0.43	0.43
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	158	599	458	122	593	450		504	385		495	355
v/s Ratio Prot		c0.35			0.33			c0.39			0.22	
v/s Ratio Perm	0.30		0.04	0.13		0.07			0.04			0.04
v/c Ratio	0.77	0.91	0.10	0.33	0.84	0.18		0.90	0.10		0.52	0.08
Uniform Delay, d1	24.0	26.0	17.5	19.3	25.0	18.0		23.7	15.1		18.6	15.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.48	0.41		0.67	0.58
Incremental Delay, d2	29.9	20.2	0.4	7.0	13.5	0.8		15.4	0.3		3.7	0.4
Delay (s)	53.9	46.2	17.9	26.3	38.5	18.9		26.7	6.5		16.1	9.1
Level of Service	D	D	B	C	D	B		C	A		B	A
Approach Delay (s)		45.7			35.2			25.2			15.4	
Approach LOS		D			D			C			B	

Intersection Summary

HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1175: Ashland Ave. □ W 81st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↖	↗		↑			↖	↗
Volume (vph)	0	0	0	26	92	32	0	527	0	0	190	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	10	10	10	11	11	11	11	11	11
Total Lost time (s)					5.0	5.0		4.0			4.0	
Lane Util. Factor					1.00	1.00		1.00			1.00	
Frbp, ped/bikes					1.00	0.96		1.00			0.98	
Flpb, ped/bikes					1.00	1.00		1.00			1.00	
Frt					1.00	0.85		1.00			0.98	
Flt Protected					0.99	1.00		1.00			1.00	
Satd. Flow (prot)					1625	1314		1149			1005	
Flt Permitted					0.99	1.00		1.00			1.00	
Satd. Flow (perm)					1625	1314		1149			1005	
Peak-hour factor, PHF	0.94	0.94	0.91	0.91	0.91	0.91	0.94	0.91	0.91	0.94	0.91	0.91
Adj. Flow (vph)	0	0	0	29	101	35	0	579	0	0	209	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	130	35	0	579	0	0	242	0
Confl. Peds. (#/hr)			11	11		12			5			41
Heavy Vehicles (%)	0%	0%	0%	8%	0%	4%	3%	3%	0%	0%	5%	3%
Parking (#/hr)								44			54	
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					23.0	23.0		58.0			58.0	
Effective Green, g (s)					23.0	23.0		58.0			58.0	
Actuated g/C Ratio					0.26	0.26		0.64			0.64	
Clearance Time (s)					5.0	5.0		4.0			4.0	
Lane Grp Cap (vph)					415	335		740			647	
v/s Ratio Prot								c0.50			0.24	
v/s Ratio Perm					0.08	0.03						
v/c Ratio					0.31	0.10		0.78			0.37	
Uniform Delay, d1					27.1	25.6		11.5			7.5	
Progression Factor					1.00	1.00		0.67			0.94	
Incremental Delay, d2					2.0	0.6		6.3			1.6	
Delay (s)					29.1	26.2		14.0			8.6	
Level of Service					C	C		B			A	
Approach Delay (s)		0.0			28.5			14.0			8.6	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1177: Ashland Ave. □ W 83rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↕			↑	↗		↑	↗
Volume (vph)	59	287	71	52	250	39	0	506	49	0	225	14
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00			1.00	0.94		1.00	0.98
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1512	1647	1370	1547	3076			1301	1053		1061	917
Flt Permitted	0.53	1.00	1.00	0.38	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	836	1647	1370	621	3076			1301	1053		1061	917
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.99	0.91	0.91	0.99	0.91	0.91
Adj. Flow (vph)	65	315	78	57	275	43	0	556	54	0	247	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	65	315	78	57	318	0	0	556	54	0	247	15
Confl. Peds. (#/hr)	3		12	12		3			18			7
Heavy Vehicles (%)	5%	2%	0%	2%	1%	3%	2%	3%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								26	26		52	52
Turn Type	Perm	NA	Perm	Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0			55.0	55.0		55.0	55.0
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0			55.0	55.0		55.0	55.0
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29			0.61	0.61		0.61	0.61
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	241	475	395	179	888			795	643		648	560
v/s Ratio Prot		c0.19			0.10			c0.43			0.23	
v/s Ratio Perm	0.08		0.06	0.09					0.05			0.02
v/c Ratio	0.27	0.66	0.20	0.32	0.36			0.70	0.08		0.38	0.03
Uniform Delay, d1	24.7	28.1	24.1	25.1	25.4			11.9	7.2		8.9	6.9
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.66	0.73		0.74	0.94
Incremental Delay, d2	2.7	7.1	1.1	4.6	1.1			3.0	0.2		1.6	0.1
Delay (s)	27.4	35.3	25.3	29.7	26.5			10.8	5.4		8.2	6.6
Level of Service	C	D	C	C	C			B	A		A	A
Approach Delay (s)		32.5			27.0			10.4			8.1	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1179: Ashland Ave. □ W 85th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	60	47	31	0	0	0	0	597	55	0	318	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.99						0.99			1.00	
Flpb, ped/bikes		0.99						1.00			1.00	
Frt		0.97						0.99			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		1627						1125			1127	
Flt Permitted		0.98						1.00			1.00	
Satd. Flow (perm)		1627						1125			1127	
Peak-hour factor, PHF	0.91	0.91	0.91	0.90	0.90	0.91	0.90	0.91	0.91	0.90	0.91	0.91
Adj. Flow (vph)	66	52	34	0	0	0	0	656	60	0	349	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	152	0	0	0	0	0	716	0	0	349	0
Confl. Peds. (#/hr)	7		8				7			13		11
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	3%	0%	6%	0%	0%	0%	0%	5%	4%	0%	5%	0%
Parking (#/hr)								42			44	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		11.9						69.1			69.1	
Effective Green, g (s)		11.9						69.1			69.1	
Actuated g/C Ratio		0.13						0.77			0.77	
Clearance Time (s)		5.0						4.0			4.0	
Vehicle Extension (s)		6.0						3.0			3.0	
Lane Grp Cap (vph)		215						863			865	
v/s Ratio Prot								c0.64			0.31	
v/s Ratio Perm		0.09										
v/c Ratio		0.71						0.83			0.40	
Uniform Delay, d1		37.4						6.7			3.5	
Progression Factor		1.00						0.56			0.72	
Incremental Delay, d2		14.6						5.0			1.4	
Delay (s)		51.9						8.8			3.9	
Level of Service		D						A			A	
Approach Delay (s)		51.9			0.0			8.8			3.9	
Approach LOS		D			A			A			A	

Intersection Summary

HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1181: Ashland Ave. □ W 87th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘		↖	↗		↖	↗
Volume (vph)	109	1044	115	59	845	151	0	500	26	0	236	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	10	10	11	10	11	11	11	11	11	11
Total Lost time (s)	2.0	5.0	5.0	2.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.92		1.00	0.89		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1504	3210	1229	1548	3179	1215		1226	930		1061	882
Flt Permitted	0.15	1.00	1.00	0.12	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	231	3210	1229	201	3179	1215		1226	930		1061	882
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	120	1147	126	65	929	166	0	549	29	0	259	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	120	1147	126	65	929	166	0	549	29	0	259	33
Confl. Peds. (#/hr)	34		53	53		34			92			16
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	6%	3%	3%	3%	4%	8%	3%	5%	4%	3%	5%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								32	32		52	52
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	39.6	33.6	33.6	37.2	32.4	32.4		39.6	39.6		39.6	39.6
Effective Green, g (s)	39.6	33.6	33.6	37.2	32.4	32.4		39.6	39.6		39.6	39.6
Actuated g/C Ratio	0.44	0.37	0.37	0.41	0.36	0.36		0.44	0.44		0.44	0.44
Clearance Time (s)	2.0	5.0	5.0	2.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	186	1198	458	154	1144	437		539	409		466	388
v/s Ratio Prot	c0.04	c0.36		0.02	0.29			c0.45			0.24	
v/s Ratio Perm	0.24		0.10	0.15		0.14			0.03			0.04
v/c Ratio	0.65	0.96	0.28	0.42	0.81	0.38		1.02	0.07		0.56	0.09
Uniform Delay, d1	17.6	27.5	19.7	19.2	26.0	21.4		25.2	14.6		18.7	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.82	0.83		0.93	0.84
Incremental Delay, d2	7.5	17.6	1.5	1.9	6.3	2.5		35.8	0.2		4.3	0.4
Delay (s)	25.1	45.1	21.2	21.1	32.4	23.9		56.6	12.4		21.8	12.7
Level of Service	C	D	C	C	C	C		E	B		C	B
Approach Delay (s)		41.2			30.5			54.3			20.8	
Approach LOS		D			C			D			C	

Intersection Summary

HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1185: Ashland Ave. □ W 91st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↑	↗		↑	↗
Volume (vph)	24	27	24	26	8	53	0	611	13	0	448	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0	4.0		4.0	4.0
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	1.00
Frbp, ped/bikes		0.99			0.95			1.00	0.95		1.00	0.97
Flpb, ped/bikes		0.99			1.00			1.00	1.00		1.00	1.00
Frt		0.96			0.92			1.00	0.85		1.00	0.85
Flt Protected		0.98			0.99			1.00	1.00		1.00	1.00
Satd. Flow (prot)		1543			1442			1054	1404		1154	1429
Flt Permitted		0.90			0.90			1.00	1.00		1.00	1.00
Satd. Flow (perm)		1404			1324			1054	1404		1154	1429
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.95	0.91	0.91	0.95	0.91	0.91
Adj. Flow (vph)	26	30	26	29	9	58	0	671	14	0	492	8
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	82	0	0	96	0	0	671	14	0	492	8
Confl. Peds. (#/hr)	16		4	4		16			9			4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	10%	4%	0%	11%	4%	0%
Parking (#/hr)								54			42	
Turn Type	Perm	NA		Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		12.0			12.0			69.0	69.0		69.0	69.0
Effective Green, g (s)		12.0			12.0			69.0	69.0		69.0	69.0
Actuated g/C Ratio		0.13			0.13			0.77	0.77		0.77	0.77
Clearance Time (s)		5.0			5.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)		8.0			8.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		187			176			808	1076		884	1095
v/s Ratio Prot								c0.64			0.43	
v/s Ratio Perm		0.06			c0.07				0.01			0.01
v/c Ratio		0.44			0.55			0.83	0.01		0.56	0.01
Uniform Delay, d1		35.9			36.5			6.7	2.5		4.3	2.5
Progression Factor		1.00			1.00			0.73	0.79		0.74	0.77
Incremental Delay, d2		6.9			10.9			7.0	0.0		2.4	0.0
Delay (s)		42.8			47.3			12.0	2.0		5.6	1.9
Level of Service		D			D			B	A		A	A
Approach Delay (s)		42.8			47.3			11.8			5.5	
Approach LOS		D			D			B			A	

Intersection Summary

HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1191: Ashland Ave. □ W 95th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↑	↗		↑	↗
Volume (vph)	178	579	43	62	663	226	0	579	24	0	200	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	10	11	11	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.93	1.00	0.98			1.00	0.97		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1533	3149	1372	1497	2945			1520	1271		1520	1155
Flt Permitted	0.12	1.00	1.00	0.32	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	197	3149	1372	506	2945			1520	1271		1520	1155
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.96	0.91	0.91
Adj. Flow (vph)	196	636	47	68	729	248	0	636	26	0	220	48
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	196	636	47	68	977	0	0	636	26	0	220	48
Confl. Peds. (#/hr)	43		37	37		43			26			60
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	4%	5%	0%	6%	5%	8%	2%	3%	0%	4%	3%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	38.8	32.8	32.8	36.4	31.6			39.4	39.4		39.4	39.4
Effective Green, g (s)	38.8	32.8	32.8	36.4	31.6			39.4	39.4		39.4	39.4
Actuated g/C Ratio	0.43	0.36	0.36	0.40	0.35			0.44	0.44		0.44	0.44
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	173	1147	500	257	1034			665	556		665	505
v/s Ratio Prot	c0.08	0.20		0.01	0.33			c0.42			0.14	
v/s Ratio Perm	c0.41		0.03	0.09					0.02			0.04
v/c Ratio	1.13	0.55	0.09	0.26	0.94			0.96	0.05		0.33	0.10
Uniform Delay, d1	21.1	22.8	18.8	17.0	28.4			24.5	14.5		16.6	14.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	108.6	1.9	0.4	0.6	17.5			25.7	0.2		1.3	0.4
Delay (s)	129.8	24.7	19.2	17.6	45.9			50.2	14.7		18.0	15.2
Level of Service	F	C	B	B	D			D	B		B	B
Approach Delay (s)		47.8			44.0			48.8			17.5	
Approach LOS		D			D			D			B	

Intersection Summary

HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1001: Ashland Ave. □ W Irving Park Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑			↑	↗		↑	↗
Volume (vph)	206	810	164	124	889	48	0	553	62	0	789	134
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.84	1.00	0.99			1.00	0.87		1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1580	3160	1172	1546	3133			1253	890		1550	1195
Flt Permitted	0.12	1.00	1.00	0.13	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	200	3160	1172	214	3133			1253	890		1550	1195
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Adj. Flow (vph)	217	853	173	131	936	51	0	582	65	0	831	141
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	217	853	173	131	987	0	0	582	65	0	831	141
Confl. Peds. (#/hr)	72		69	69		72			81			59
Confl. Bikes (#/hr)			5			7			7			6
Heavy Vehicles (%)	1%	1%	2%	3%	0%	4%	2%	0%	3%	1%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								36	36		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	41.2	33.2	33.2	38.8	32.0			57.0	57.0		57.0	57.0
Effective Green, g (s)	41.2	33.2	33.2	38.8	32.0			57.0	57.0		57.0	57.0
Actuated g/C Ratio	0.37	0.30	0.30	0.35	0.29			0.52	0.52		0.52	0.52
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	0.2	0.2	0.2	0.2	0.2			0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	175	953	353	157	911			649	461		803	619
v/s Ratio Prot	c0.09	0.27		0.05	0.32			0.46			c0.54	
v/s Ratio Perm	c0.37		0.15	0.24					0.07			0.12
v/c Ratio	1.24	0.90	0.49	0.83	1.08			0.90	0.14		1.03	0.23
Uniform Delay, d1	29.6	36.7	31.5	27.4	39.0			23.9	13.8		26.5	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.58	0.74		1.00	1.00
Incremental Delay, d2	147.0	10.6	0.4	28.9	55.0			11.5	0.4		41.1	0.9
Delay (s)	176.7	47.3	31.9	56.3	94.0			25.4	10.6		67.6	15.3
Level of Service	F	D	C	E	F			C	B		E	B
Approach Delay (s)		67.7			89.6			23.9			60.0	
Approach LOS		E			F			C			E	

Intersection Summary

HCM 2000 Control Delay	64.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1003: Ashland Ave. □ W Grace St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	32	76	30	0	0	0	0	639	32	0	751	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.98						0.99			1.00	
Flpb, ped/bikes		0.99						1.00			1.00	
Frt		0.97						0.99			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1509						1158			1203	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1509						1158			1203	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.97	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	34	80	32	0	0	0	0	673	34	0	791	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	146	0	0	0	0	0	707	0	0	813	0
Confl. Peds. (#/hr)	23		20				23		22			11
Confl. Bikes (#/hr)			1				1		1			3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	3%	2%	5%
Parking (#/hr)								44			38	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		22.0						80.0			80.0	
Effective Green, g (s)		22.0						80.0			80.0	
Actuated g/C Ratio		0.20						0.73			0.73	
Clearance Time (s)		4.0						4.0			4.0	
Lane Grp Cap (vph)		301						842			874	
v/s Ratio Prot								0.61			c0.68	
v/s Ratio Perm		0.10										
v/c Ratio		0.49						0.84			0.93	
Uniform Delay, d1		39.0						10.5			12.6	
Progression Factor		1.00						1.53			1.39	
Incremental Delay, d2		5.5						8.3			9.4	
Delay (s)		44.5						24.4			27.0	
Level of Service		D						C			C	
Approach Delay (s)		44.5			0.0			24.4			27.0	
Approach LOS		D			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.4					HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			110.0					Sum of lost time (s)		8.0		
Intersection Capacity Utilization			68.1%					ICU Level of Service		C		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

1005: Ashland Ave. □ W Addison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↑	↗		↑	↗
Volume (vph)	119	596	69	134	493	77	0	408	40	0	633	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	10	10	9	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.92		1.00	0.97		1.00	0.91
Flpb, ped/bikes	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1511	1573	1347	1568	1588	1312		1189	995		1250	999
Flt Permitted	0.27	1.00	1.00	0.18	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	436	1573	1347	292	1588	1312		1189	995		1250	999
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	125	627	73	141	519	81	0	429	42	0	666	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	125	627	73	141	519	81	0	429	42	0	666	49
Confl. Peds. (#/hr)	30		19	19		30			2			25
Confl. Bikes (#/hr)			2			7						
Heavy Vehicles (%)	0%	3%	0%	1%	2%	0%	8%	1%	0%	2%	3%	0%
Parking (#/hr)								42	42		32	32
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	48.0	48.0	48.0	48.0	48.0	48.0		53.0	53.0		53.0	53.0
Effective Green, g (s)	48.0	48.0	48.0	48.0	48.0	48.0		53.0	53.0		53.0	53.0
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.44	0.44		0.48	0.48		0.48	0.48
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	190	686	587	127	692	572		572	479		602	481
v/s Ratio Prot		0.40			0.33			0.36			c0.53	
v/s Ratio Perm	0.29		0.05	c0.48		0.06			0.04			0.05
v/c Ratio	0.66	0.91	0.12	1.11	0.75	0.14		0.75	0.09		1.11	0.10
Uniform Delay, d1	24.5	29.1	18.5	31.0	26.0	18.6		23.1	15.4		28.5	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.97	1.08		0.61	0.44
Incremental Delay, d2	8.0	16.7	0.1	112.5	4.6	0.1		7.6	0.3		58.0	0.2
Delay (s)	32.5	45.7	18.6	143.5	30.5	18.7		30.0	17.0		75.4	7.1
Level of Service	C	D	B	F	C	B		C	B		E	A
Approach Delay (s)		41.3			50.8			28.8			70.7	
Approach LOS		D			D			C			E	

Intersection Summary

HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1007: Ashland Ave. □ W Roscoe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕			↑			↑	↗	
Volume (vph)	0	0	0	84	174	82	0	487	0	0	558	46	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11	
Total Lost time (s)					4.0			4.0			4.0	4.0	
Lane Util. Factor					1.00			1.00			1.00	1.00	
Frbp, ped/bikes					0.98			1.00			1.00	0.80	
Flpb, ped/bikes					0.98			1.00			1.00	1.00	
Frt					0.97			1.00			1.00	0.85	
Flt Protected					0.99			1.00			1.00	1.00	
Satd. Flow (prot)					1592			1499			1126	774	
Flt Permitted					0.99			1.00			1.00	1.00	
Satd. Flow (perm)					1592			1499			1126	774	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	88	183	86	0	513	0	0	587	48	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	357	0	0	513	0	0	587	48	
Confl. Peds. (#/hr)			25	25		26			18			39	
Confl. Bikes (#/hr)			1			1			6			5	
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	1%	0%	0%	2%	0%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3	
Parking (#/hr)								6			48	48	
Turn Type				Perm	NA			NA			NA	Perm	
Protected Phases					8			2			6		
Permitted Phases				8								6	
Actuated Green, G (s)					32.0			70.0			70.0	70.0	
Effective Green, g (s)					32.0			70.0			70.0	70.0	
Actuated g/C Ratio					0.29			0.64			0.64	0.64	
Clearance Time (s)					4.0			4.0			4.0	4.0	
Lane Grp Cap (vph)					463			953			716	492	
v/s Ratio Prot								0.34			c0.52		
v/s Ratio Perm					0.22							0.06	
v/c Ratio					0.77			0.54			0.82	0.10	
Uniform Delay, d1					35.7			11.1			15.2	7.8	
Progression Factor					1.00			0.96			0.57	0.82	
Incremental Delay, d2					11.8			1.4			4.2	0.2	
Delay (s)					47.4			12.0			12.9	6.5	
Level of Service					D			B			B	A	
Approach Delay (s)		0.0			47.4			12.0			12.4		
Approach LOS		A			D			B			B		
Intersection Summary													
HCM 2000 Control Delay			20.6		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.80										
Actuated Cycle Length (s)			110.0		Sum of lost time (s)						8.0		
Intersection Capacity Utilization			64.8%		ICU Level of Service						C		
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1009: Ashland Ave. □ W School St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	110	218	33	18	22	25	0	531	22	0	462	52
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.98			0.95			0.99			0.95	
Flpb, ped/bikes		0.97			0.98			1.00			1.00	
Frt		0.99			0.95			0.99			0.99	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1546			1469			1346			1432	
Flt Permitted		0.88			0.87			1.00			1.00	
Satd. Flow (perm)		1379			1303			1346			1432	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	116	229	35	19	23	26	0	559	23	0	486	55
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	380	0	0	68	0	0	582	0	0	541	0
Confl. Peds. (#/hr)	42		71	71		42			29			139
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	0%	1%	0%	1%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								22			0	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		40.0			40.0			62.0			62.0	
Effective Green, g (s)		40.0			40.0			62.0			62.0	
Actuated g/C Ratio		0.36			0.36			0.56			0.56	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		501			473			758			807	
v/s Ratio Prot								c0.43			0.38	
v/s Ratio Perm		c0.28			0.05							
v/c Ratio		0.76			0.14			0.77			0.67	
Uniform Delay, d1		30.8			23.5			18.5			16.8	
Progression Factor		1.00			1.00			0.44			0.67	
Incremental Delay, d2		10.3			0.6			3.2			2.5	
Delay (s)		41.1			24.1			11.3			13.8	
Level of Service		D			C			B			B	
Approach Delay (s)		41.1			24.1			11.3			13.8	
Approach LOS		D			C			B			B	

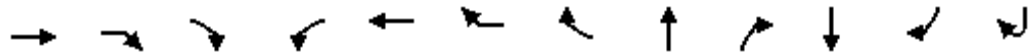
Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	EBT	EBR	EBR2	WBL	WBT	WBR	WBR2	NBT	NBR	SBT	SBR	SBR2
Lane Configurations	↑				↑	↗		↑	↗	↑	↗	
Volume (vph)	396	57	38	12	366	156	77	561	71	449	35	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	11	10	12	11	11	11	11	11
Total Lost time (s)	5.0				5.0	5.0		6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00				1.00	1.00		1.00	1.00	1.00	1.00	
Frbp, ped/bikes	0.98				1.00	0.81		1.00	0.73	1.00	0.89	
Flpb, ped/bikes	1.00				1.00	1.00		1.00	1.00	1.00	1.00	
Frt	0.97				1.00	0.85		1.00	0.85	1.00	0.85	
Flt Protected	1.00				1.00	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1611				1719	1080		1331	829	1506	1313	
Flt Permitted	1.00				0.63	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (perm)	1611				1082	1080		1331	829	1506	1313	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	417	60	40	13	385	164	81	591	75	473	37	4
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	517	0	0	0	398	245	0	591	75	473	41	0
Confl. Peds. (#/hr)		44		44		76			95		63	
Confl. Bikes (#/hr)		5				13			11		6	
Heavy Vehicles (%)	3%	4%	0%	0%	1%	11%	1%	2%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								24	24	0		
Turn Type	NA			Perm	NA	Perm		NA	Perm	NA	Perm	
Protected Phases	10				14			2		6		
Permitted Phases				14		14			2		6	
Actuated Green, G (s)	32.0				32.0	32.0		40.0	40.0	40.0	40.0	
Effective Green, g (s)	32.0				32.0	32.0		40.0	40.0	40.0	40.0	
Actuated g/C Ratio	0.29				0.29	0.29		0.36	0.36	0.36	0.36	
Clearance Time (s)	5.0				5.0	5.0		6.0	6.0	6.0	6.0	
Lane Grp Cap (vph)	468				314	314		484	301	547	477	
v/s Ratio Prot	0.32							c0.44		0.31		
v/s Ratio Perm					c0.37	0.23			0.09		0.03	
v/c Ratio	1.10				1.27	0.78		1.22	0.25	0.86	0.09	
Uniform Delay, d1	39.0				39.0	35.8		35.0	24.5	32.5	23.0	
Progression Factor	1.00				1.00	1.00		0.76	0.81	0.83	0.96	
Incremental Delay, d2	73.2				143.2	17.3		111.4	1.3	13.0	0.3	
Delay (s)	112.2				182.2	53.1		137.9	21.1	40.0	22.3	
Level of Service	F				F	D		F	C	D	C	
Approach Delay (s)	112.2				133.0			124.7		38.6		
Approach LOS	F				F			F		D		

Intersection Summary

HCM 2000 Control Delay	127.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1011: Ashland Ave. □ N. Lincoln Ave. □ W Belmont Ave.

8/8/2013



Movement	SEL2	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR	NWR2
Lane Configurations										
Volume (vph)	4	53	271	93	12	7	31	279	97	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	11	11	11	12	9	11	11	11
Total Lost time (s)		6.0	6.0				6.0	6.0		
Lane Util. Factor		1.00	1.00				1.00	1.00		
Frbp, ped/bikes		1.00	1.00				1.00	1.00		
Flpb, ped/bikes		1.00	1.00				1.00	1.00		
Frt		1.00	0.96				1.00	0.96		
Flt Protected		0.95	1.00				0.95	1.00		
Satd. Flow (prot)		1511	1639				1539	1661		
Flt Permitted		0.19	1.00				0.19	1.00		
Satd. Flow (perm)		303	1639				309	1661		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	56	285	98	13	7	33	294	102	8
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	60	396	0	0	0	40	404	0	0
Confl. Peds. (#/hr)										
Confl. Bikes (#/hr)										
Heavy Vehicles (%)	0%	2%	2%	1%	0%	0%	0%	0%	0%	25%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										
Turn Type	Perm	Perm	NA			Perm	Perm	NA		
Protected Phases			4					8		
Permitted Phases	4	4				8	8			
Actuated Green, G (s)		21.0	21.0				21.0	21.0		
Effective Green, g (s)		21.0	21.0				21.0	21.0		
Actuated g/C Ratio		0.19	0.19				0.19	0.19		
Clearance Time (s)		6.0	6.0				6.0	6.0		
Lane Grp Cap (vph)		57	312				58	317		
v/s Ratio Prot			0.24					c0.24		
v/s Ratio Perm		0.20					0.13			
v/c Ratio		1.05	1.27				0.69	1.27		
Uniform Delay, d1		44.5	44.5				41.5	44.5		
Progression Factor		1.00	1.00				1.00	1.00		
Incremental Delay, d2		134.7	144.0				50.6	145.8		
Delay (s)		179.2	188.5				92.1	190.3		
Level of Service		F	F				F	F		
Approach Delay (s)			187.3					181.5		
Approach LOS			F					F		

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1012: Ashland Ave. □ W Barry Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↑			↕	
Volume (vph)	0	0	0	129	306	32	0	651	0	0	732	47
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frbp, ped/bikes					0.99			1.00			0.98	
Flpb, ped/bikes					0.97			1.00			1.00	
Frt					0.99			1.00			0.99	
Flt Protected					0.99			1.00			1.00	
Satd. Flow (prot)					1907			1413			1238	
Flt Permitted					0.99			1.00			1.00	
Satd. Flow (perm)					1907			1413			1238	
Peak-hour factor, PHF	0.92	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.95	0.92	0.95	0.95
Adj. Flow (vph)	0	0	0	136	322	34	0	685	0	0	771	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	492	0	0	685	0	0	820	0
Confl. Peds. (#/hr)			40	40		26			33			56
Confl. Bikes (#/hr)			2			2			2			3
Heavy Vehicles (%)	0%	0%	0%	3%	0%	3%	0%	1%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								16			30	30
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					29.0			73.0			73.0	
Effective Green, g (s)					29.0			73.0			73.0	
Actuated g/C Ratio					0.26			0.66			0.66	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					502			937			821	
v/s Ratio Prot								0.48			c0.66	
v/s Ratio Perm					0.26							
v/c Ratio					0.98			0.73			1.00	
Uniform Delay, d1					40.2			12.1			18.5	
Progression Factor					1.00			0.30			0.93	
Incremental Delay, d2					35.5			2.1			25.5	
Delay (s)					75.7			5.7			42.6	
Level of Service					E			A			D	
Approach Delay (s)		0.0			75.7			5.7			42.6	
Approach LOS		A			E			A			D	

Intersection Summary			
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1014: Ashland Ave. □ W Wellington Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	120	229	107	0	0	0	0	657	68	0	696	75
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frb, ped/bikes		0.99						0.99			0.99	
Flpb, ped/bikes		0.98						1.00			1.00	
Frt		0.97						0.99			0.99	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1666						1373			1401	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1666						1373			1401	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.96	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	126	241	113	0	0	0	0	692	72	0	733	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	480		0	0	0	0	764		0	0	812
Confl. Peds. (#/hr)	27		8				27			11		22
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	2%	2%	1%	0%	0%	43%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								16	16		8	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		34.0						68.0			68.0	
Effective Green, g (s)		34.0						68.0			68.0	
Actuated g/C Ratio		0.31						0.62			0.62	
Clearance Time (s)		4.0						4.0			4.0	
Lane Grp Cap (vph)		514						848			866	
v/s Ratio Prot								0.56			c0.58	
v/s Ratio Perm		0.29										
v/c Ratio		0.93						0.90			0.94	
Uniform Delay, d1		36.9						18.1			19.1	
Progression Factor		1.00						0.71			1.02	
Incremental Delay, d2		26.3						1.7			7.2	
Delay (s)		63.2						14.5			26.7	
Level of Service		E						B			C	
Approach Delay (s)		63.2			0.0			14.5			26.7	
Approach LOS		E			A			B			C	
Intersection Summary												
HCM 2000 Control Delay		30.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.94										
Actuated Cycle Length (s)		110.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		83.8%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 1018: Ashland Ave. □ W Diversey Pkwy.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	533	55	170	639	83	0	735	70	0	1014	98
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	10	10	9	11	11	11	11	11	11
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.90		1.00	0.91		1.00	0.79
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1580	1647	1228	1565	1647	1228		758	587		1385	1144
Flt Permitted	0.13	1.00	1.00	0.13	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	215	1647	1228	213	1647	1228		758	587		1385	1144
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	177	561	58	179	673	87	0	774	74	0	1067	103
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	177	561	58	179	673	87	0	774	74	0	1067	103
Confl. Peds. (#/hr)	29		30	30		29			17			52
Confl. Bikes (#/hr)			12			7			9			8
Heavy Vehicles (%)	1%	2%	0%	2%	2%	1%	0%	1%	0%	4%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								92	92		16	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	36.0	31.0	31.0	36.0	31.0	31.0		63.0	63.0		63.0	63.0
Effective Green, g (s)	36.0	31.0	31.0	36.0	31.0	31.0		63.0	63.0		63.0	63.0
Actuated g/C Ratio	0.33	0.28	0.28	0.33	0.28	0.28		0.57	0.57		0.57	0.57
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	132	464	346	131	464	346		434	336		793	655
v/s Ratio Prot	0.06	0.34		c0.06	c0.41			c1.02			0.77	
v/s Ratio Perm	0.38		0.05	0.39		0.07			0.13			0.09
v/c Ratio	1.34	1.21	0.17	1.37	1.45	0.25		1.78	0.22		1.35	0.16
Uniform Delay, d1	35.9	39.5	29.8	35.9	39.5	30.5		23.5	11.5		23.5	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.13	0.92
Incremental Delay, d2	195.5	112.8	1.0	205.9	214.5	1.7		361.7	1.5		162.0	0.4
Delay (s)	231.4	152.3	30.8	241.8	254.0	32.3		385.2	13.0		188.6	10.6
Level of Service	F	F	C	F	F	C		F	B		F	B
Approach Delay (s)		161.0			231.1			352.8			172.9	
Approach LOS		F			F			F			F	

Intersection Summary

HCM 2000 Control Delay	225.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	111.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1019: Ashland Ave. □ W Wrightwood Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	54	211	49	96	209	31	0	676	54	0	718	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.99			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1546			1565			1206			1486	
Flt Permitted		0.84			0.68			1.00			1.00	
Satd. Flow (perm)		1307			1075			1206			1486	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	222	52	101	220	33	0	712	57	0	756	46
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	331	0	0	354	0	0	769	0	0	802	0
Confl. Peds. (#/hr)	9		11	11		9			8			20
Confl. Bikes (#/hr)			3						1			2
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	6%	1%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								38	38		0	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		40.0			40.0			82.0			82.0	
Effective Green, g (s)		40.0			40.0			82.0			82.0	
Actuated g/C Ratio		0.31			0.31			0.63			0.63	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		402			330			760			937	
v/s Ratio Prot								c0.64			0.54	
v/s Ratio Perm		0.25			c0.33							
v/c Ratio		0.82			1.07			1.01			0.86	
Uniform Delay, d1		41.7			45.0			24.0			19.3	
Progression Factor		1.00			1.00			0.34			1.00	
Incremental Delay, d2		17.2			70.2			23.3			9.9	
Delay (s)		58.9			115.2			31.3			29.2	
Level of Service		E			F			C			C	
Approach Delay (s)		58.9			115.2			31.3			29.2	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1023: Ashland Ave. □ W Fullerton Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖	↖		↖	↖		↖	↖
Volume (vph)	148	648	16	96	524	28	0	730	75	0	679	170
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	9	10	9	11	11	11	11	11	11
Total Lost time (s)	2.0	5.0		2.0	5.0	5.0		5.0	5.0		5.0	2.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.93		1.00	0.93		1.00	0.93
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1580	3144		1536	1631	1234		1516	1180		1520	1212
Flt Permitted	0.10	1.00		0.22	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	173	3144		350	1631	1234		1516	1180		1520	1212
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	156	682	17	101	552	29	0	768	79	0	715	179
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	156	699	0	101	552	29	0	768	79	0	715	179
Confl. Peds. (#/hr)	21		21	21		21			34			20
Confl. Bikes (#/hr)			9			2			6			
Heavy Vehicles (%)	1%	1%	0%	0%	3%	4%	0%	1%	1%	9%	3%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								4	4		0	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm		NA	Perm		NA	pm+ov
Protected Phases	7	4		3	8			2 10			6	7
Permitted Phases	4			8		8			2 10			6
Actuated Green, G (s)	49.8	41.8		52.2	43.0	43.0		67.0	67.0		64.0	72.0
Effective Green, g (s)	49.8	41.8		52.2	43.0	43.0		65.0	65.0		64.0	72.0
Actuated g/C Ratio	0.38	0.32		0.40	0.33	0.33		0.50	0.50		0.49	0.55
Clearance Time (s)	2.0	5.0		2.0	5.0	5.0					5.0	2.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0					3.0	3.0
Lane Grp Cap (vph)	152	1010		224	539	408		758	590		748	671
v/s Ratio Prot	c0.06	0.22		c0.03	c0.34			c0.51			0.47	0.02
v/s Ratio Perm	0.33			0.15		0.02			0.07			0.13
v/c Ratio	1.03	0.69		0.45	1.02	0.07		1.01	0.13		0.96	0.27
Uniform Delay, d1	34.0	38.5		26.6	43.5	29.8		32.5	17.4		31.6	15.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.47	0.57		1.15	1.19
Incremental Delay, d2	80.1	3.9		1.4	45.0	0.3		13.3	0.0		16.4	0.1
Delay (s)	114.1	42.4		28.0	88.5	30.1		28.6	9.9		52.8	18.2
Level of Service	F	D		C	F	C		C	A		D	B
Approach Delay (s)		55.5			77.1			26.9			45.9	
Approach LOS		E			E			C			D	

Intersection Summary

HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1024: Medill Ave. □ Ashland Ave. □ N Clybourn Ave.

8/8/2013



Movement	EBT	EBR	WBL2	WBT	WBR	NBT	NBR	SBT	SBR	SBR2	NEL
Lane Configurations	↑	↘		↕		↗		↖			↗
Volume (vph)	509	209	28	560	157	739	32	687	20	7	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	16
Total Lost time (s)	5.0	5.0		5.0		5.0		5.0			
Lane Util. Factor	1.00	1.00		0.95		1.00		1.00			
Frbp, ped/bikes	1.00	0.93		0.99		1.00		1.00			
Flpb, ped/bikes	1.00	1.00		1.00		1.00		1.00			
Frt	1.00	0.85		0.97		0.99		0.99			
Flt Protected	1.00	1.00		1.00		1.00		1.00			
Satd. Flow (prot)	1740	1371		3134		1540		1449			
Flt Permitted	1.00	1.00		0.84		1.00		1.00			
Satd. Flow (perm)	1740	1371		2651		1540		1449			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92
Adj. Flow (vph)	536	220	29	589	165	778	34	723	21	7	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	536	220	0	783	0	812	0	751	0	0	0
Confl. Peds. (#/hr)		34			11						
Heavy Vehicles (%)	0%	0%	0%	1%	2%	1%	3%	4%	0%	14%	2%
Parking (#/hr)						0		6			
Turn Type	NA	Perm	Perm	NA		NA		NA			
Protected Phases	4			8		2		6			10
Permitted Phases		4	8								
Actuated Green, G (s)	56.0	56.0		56.0		64.0		64.0			
Effective Green, g (s)	56.0	56.0		56.0		64.0		64.0			
Actuated g/C Ratio	0.43	0.43		0.43		0.49		0.49			
Clearance Time (s)	5.0	5.0		5.0		5.0		5.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0			
Lane Grp Cap (vph)	749	590		1141		758		713			
v/s Ratio Prot	c0.31					c0.53		0.52			
v/s Ratio Perm		0.16		0.30							
v/c Ratio	0.72	0.37		0.69		1.07		1.05			
Uniform Delay, d1	30.4	25.1		29.9		33.0		33.0			
Progression Factor	1.00	1.00		1.00		1.11		0.52			
Incremental Delay, d2	5.8	1.8		3.4		35.0		37.9			
Delay (s)	36.2	26.9		33.3		71.7		55.1			
Level of Service	D	C		C		E		E			
Approach Delay (s)	33.5			33.3		71.7		55.1			0.0
Approach LOS	C			C		E		E			A

Intersection Summary

HCM 2000 Control Delay	48.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	120.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1025: Ashland Ave. □ W Webster Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖↗			↖			↖	
Volume (vph)	104	216	9	220	360	22	0	786	133	0	728	86
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		0.95			1.00			1.00	
Frbp, ped/bikes		1.00	0.97		1.00			0.99			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.99			0.98			0.99	
Flt Protected		0.98	1.00		0.98			1.00			1.00	
Satd. Flow (prot)		1651	1384		3092			1513			1471	
Flt Permitted		0.48	1.00		0.61			1.00			1.00	
Satd. Flow (perm)		814	1384		1932			1513			1471	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	109	227	9	232	379	23	0	827	140	0	766	91
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	336	9	0	634	0	0	967	0	0	857	0
Confl. Peds. (#/hr)	4		4	4		4			6			6
Heavy Vehicles (%)	0%	0%	0%	1%	0%	5%	0%	1%	0%	10%	5%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								0	0		0	
Turn Type	Perm	NA	Perm	Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		47.0	47.0		47.0			75.0			75.0	
Effective Green, g (s)		47.0	47.0		47.0			75.0			75.0	
Actuated g/C Ratio		0.36	0.36		0.36			0.58			0.58	
Clearance Time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Grp Cap (vph)		294	500		698			872			848	
v/s Ratio Prot								c0.64			0.58	
v/s Ratio Perm		c0.41	0.01		0.33							
v/c Ratio		1.14	0.02		1.02dl			1.11			1.01	
Uniform Delay, d1		41.5	26.7		39.5			27.5			27.5	
Progression Factor		1.00	1.00		1.00			1.01			0.53	
Incremental Delay, d2		96.8	0.1		17.8			63.2			23.0	
Delay (s)		138.3	26.7		57.3			90.9			37.6	
Level of Service		F	C		E			F			D	
Approach Delay (s)		135.4			57.3			90.9			37.6	
Approach LOS		F			E			F			D	

Intersection Summary

HCM 2000 Control Delay	72.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1026: Ashland Ave. □ N Elston Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	319	70	0	518	218	0	545	1	0	695	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	9	16	16	12	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0		4.0	3.0		4.0			3.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.98		1.00	0.97		1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85		1.00	0.85		1.00			1.00	
Flt Protected	0.95	1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1596	1647	1336		2020	1480		1550			1515	
Flt Permitted	0.10	1.00	1.00		1.00	1.00		1.00			1.00	
Satd. Flow (perm)	166	1647	1336		2020	1480		1550			1515	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.95	0.95	0.92	0.95	0.95
Adj. Flow (vph)	21	336	74	0	545	229	0	574	1	0	732	19
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	21	336	74	0	545	229	0	575	0	0	751	0
Confl. Peds. (#/hr)	8		9	9		8			3			1
Heavy Vehicles (%)	0%	2%	1%	0%	1%	0%	0%	1%	0%	5%	3%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm		NA	custom		NA			NA	
Protected Phases		4			8	1		2			6	
Permitted Phases	4		4			8						
Actuated Green, G (s)	43.0	43.0	43.0		43.0	50.0		69.0			80.0	
Effective Green, g (s)	43.0	43.0	43.0		43.0	50.0		69.0			80.0	
Actuated g/C Ratio	0.33	0.33	0.33		0.33	0.38		0.53			0.62	
Clearance Time (s)	4.0	4.0	4.0		4.0	3.0		4.0			3.0	
Lane Grp Cap (vph)	54	544	441		668	569		822			932	
v/s Ratio Prot		0.20			c0.27	0.02		0.37			c0.50	
v/s Ratio Perm	0.13		0.06			0.13						
v/c Ratio	0.39	0.62	0.17		0.82	0.40		0.70			0.81	
Uniform Delay, d1	33.4	36.6	30.8		39.9	29.1		22.8			19.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00		0.54			0.55	
Incremental Delay, d2	19.8	5.2	0.8		10.6	2.1		2.3			2.1	
Delay (s)	53.2	41.8	31.6		50.5	31.2		14.6			12.7	
Level of Service	D	D	C		D	C		B			B	
Approach Delay (s)		40.6			44.8			14.6			12.7	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1027: Ashland Ave. □ W Armitage Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	448	287	29	5	412	0	165	271	21	0	572	229
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	10	10	16	16	16	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0			5.0		2.0	4.0			4.0	3.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	0.96
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.99			1.00		1.00	0.99			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1637	1608			1980		1637	1467			1689	1238
Flt Permitted	0.14	1.00			1.00		0.11	1.00			1.00	1.00
Satd. Flow (perm)	237	1608			1972		182	1467			1689	1238
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.91	0.95	0.95
Adj. Flow (vph)	472	302	31	5	434	0	174	285	22	0	602	241
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	472	333	0	0	439	0	174	307	0	0	602	241
Confl. Peds. (#/hr)	6		5	5		6	15		12			15
Heavy Vehicles (%)	1%	3%	0%	0%	3%	0%	1%	4%	5%	11%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	0	0
Parking (#/hr)								0				0
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA			NA	pm+ov
Protected Phases	7	4			8		5	2			6	7
Permitted Phases	4			8			2					6
Actuated Green, G (s)	61.4	61.4			30.4		59.6	59.6			49.0	77.0
Effective Green, g (s)	61.4	61.4			30.4		59.6	59.6			49.0	77.0
Actuated g/C Ratio	0.47	0.47			0.23		0.46	0.46			0.38	0.59
Clearance Time (s)	3.0	5.0			5.0		2.0	4.0			4.0	3.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	413	759			461		179	672			636	733
v/s Ratio Prot	c0.25	0.21					c0.06	0.21			c0.36	0.07
v/s Ratio Perm	c0.29				0.22		0.38					0.12
v/c Ratio	1.14	0.44			0.95		0.97	0.46			0.95	0.33
Uniform Delay, d1	38.5	22.8			49.1		28.8	24.1			39.2	13.4
Progression Factor	1.00	1.00			1.00		1.70	1.01			0.91	0.60
Incremental Delay, d2	89.4	0.4			29.9		32.0	0.8			19.1	0.2
Delay (s)	127.8	23.2			79.0		81.1	25.1			54.9	8.2
Level of Service	F	C			E		F	C			D	A
Approach Delay (s)		84.6			79.0			45.4			41.5	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	62.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1029: Ashland Ave. □ W Cortland St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations		↑	↗		↔			↑			↑			
Volume (vph)	2	185	16	113	265	9	0	489	107	0	573	100		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11		
Total Lost time (s)		5.0	5.0		5.0			4.0			4.0			
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00			
Frbp, ped/bikes		1.00	0.95		1.00			0.92			0.98			
Flpb, ped/bikes		1.00	1.00		0.99			1.00			1.00			
Frt		1.00	0.85		1.00			0.98			0.98			
Flt Protected		1.00	1.00		0.99			1.00			1.00			
Satd. Flow (prot)		1713	1451		1692			888			1463			
Flt Permitted		1.00	1.00		0.72			1.00			1.00			
Satd. Flow (perm)		1709	1451		1230			888			1463			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95		
Adj. Flow (vph)	2	195	17	119	279	9	0	515	113	0	603	105		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	0	197	17	0	407	0	0	628	0	0	708	0		
Confl. Peds. (#/hr)	62		8	8		62			125			24		
Heavy Vehicles (%)	0%	5%	0%	5%	3%	0%	0%	2%	0%	50%	3%	5%		
Parking (#/hr)								64				0		
Turn Type	Perm	NA	Perm	pm+pt	NA			NA			NA			
Protected Phases		4		3	8			2			6			
Permitted Phases	4		4	8										
Actuated Green, G (s)		42.0	42.0		42.0			79.0			79.0			
Effective Green, g (s)		42.0	42.0		42.0			79.0			79.0			
Actuated g/C Ratio		0.32	0.32		0.32			0.61			0.61			
Clearance Time (s)		5.0	5.0		5.0			4.0			4.0			
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0			
Lane Grp Cap (vph)		552	468		397			539			889			
v/s Ratio Prot								c0.71			0.48			
v/s Ratio Perm		0.12	0.01		c0.33									
v/c Ratio		0.36	0.04		1.03			1.17			0.80			
Uniform Delay, d1		33.7	30.1		44.0			25.5			19.4			
Progression Factor		1.00	1.00		1.00			1.18			0.52			
Incremental Delay, d2		1.8	0.1		51.8			90.7			5.1			
Delay (s)		35.5	30.3		95.8			120.9			15.1			
Level of Service		D	C		F			F			B			
Approach Delay (s)		35.1			95.8			120.9			15.1			
Approach LOS		D			F			F			B			
Intersection Summary														
HCM 2000 Control Delay			68.0									HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio			1.14											
Actuated Cycle Length (s)			130.0								12.0			
Intersection Capacity Utilization			85.6%										ICU Level of Service	E
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

1030: Ashland Ave. □ W Wabansia Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	32	4	74	9	4	26	0	551	3	0	675	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.95			0.97			1.00			1.00	
Flpb, ped/bikes		0.99			0.99			1.00			1.00	
Frt		0.91			0.91			1.00			1.00	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1414			1456			1300			1473	
Flt Permitted		0.90			0.95			1.00			1.00	
Satd. Flow (perm)		1297			1396			1300			1473	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.95	0.95	0.92	0.95	0.95
Adj. Flow (vph)	34	4	78	9	4	27	0	580	3	0	711	8
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	116	0	0	40	0	0	583	0	0	719	0
Confl. Peds. (#/hr)	6		15	15		6						8
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	8%	3%	0%	0%	6%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								26	26		0	0
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.0			18.0			104.0			104.0	
Effective Green, g (s)		18.0			18.0			104.0			104.0	
Actuated g/C Ratio		0.14			0.14			0.80			0.80	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		179			193			1040			1178	
v/s Ratio Prot								0.45			c0.49	
v/s Ratio Perm		c0.09			0.03							
v/c Ratio		0.65			0.21			0.56			0.61	
Uniform Delay, d1		53.0			49.7			4.7			5.1	
Progression Factor		1.00			1.00			0.52			0.57	
Incremental Delay, d2		10.6			1.1			1.3			1.3	
Delay (s)		63.6			50.8			3.8			4.2	
Level of Service		E			D			A			A	
Approach Delay (s)		63.6			50.8			3.8			4.2	
Approach LOS		E			D			A			A	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1033: Ashland Ave. □ W North Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↑	↗		↑	↗
Volume (vph)	101	584	57	140	558	34	0	594	143	0	718	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	9	9	9	9	9	11	11	11	11	11	11
Total Lost time (s)	3.0	4.0		3.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94		1.00	0.94
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1480	2714		1520	2985			1250	985		1177	886
Flt Permitted	0.17	1.00		0.14	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	270	2714		217	2985			1250	985		1177	886
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	106	615	60	147	587	36	0	625	151	0	756	31
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	106	675	0	147	623	0	0	625	151	0	756	31
Confl. Peds. (#/hr)			48	48					21			20
Heavy Vehicles (%)	4%	11%	4%	1%	2%	6%	2%	3%	3%	0%	2%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								32	32		42	42
Turn Type	pm+pt	NA		pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	38.0	31.0		38.0	31.0			81.0	81.0		81.0	81.0
Effective Green, g (s)	38.0	31.0		38.0	31.0			81.0	81.0		81.0	81.0
Actuated g/C Ratio	0.29	0.24		0.29	0.24			0.62	0.62		0.62	0.62
Clearance Time (s)	3.0	4.0		3.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	144	647		133	711			778	613		733	552
v/s Ratio Prot	0.04	0.25		c0.06	0.21			0.50			c0.64	
v/s Ratio Perm	0.18			c0.26					0.15			0.03
v/c Ratio	0.74	1.04		1.11	0.88			0.80	0.25		1.03	0.06
Uniform Delay, d1	36.8	49.5		41.7	47.7			18.5	10.9		24.5	9.6
Progression Factor	1.00	1.00		1.00	1.00			0.85	0.82		0.46	0.53
Incremental Delay, d2	17.7	47.2		109.1	14.3			7.4	0.8		38.8	0.2
Delay (s)	54.4	96.7		150.8	61.9			23.1	9.8		50.1	5.3
Level of Service	D	F		F	E			C	A		D	A
Approach Delay (s)		90.9			78.9			20.5			48.4	
Approach LOS		F			E			C			D	

Intersection Summary

HCM 2000 Control Delay	59.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1039: Ashland Ave. □ W Blackhawk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	57	40	5	39	24	66	0	593	26	0	788	16
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	11	11	11	11	11	11	11	11	11
Total Lost time (s)		3.0			3.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.96			1.00			1.00	
Flpb, ped/bikes		0.98			0.97			1.00			1.00	
Frt		0.99			0.93			0.99			1.00	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1860			1456			1146			1438	
Flt Permitted		0.72			0.90			1.00			1.00	
Satd. Flow (perm)		1381			1324			1146			1438	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	60	42	5	41	25	69	0	624	27	0	829	17
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	107	0	0	135	0	0	651	0	0	846	0
Confl. Peds. (#/hr)	18		38	38		18			5			47
Heavy Vehicles (%)	4%	0%	20%	5%	0%	2%	4%	1%	0%	1%	1%	0%
Parking (#/hr)								46				12
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			100.0			100.0	
Effective Green, g (s)		24.0			24.0			100.0			100.0	
Actuated g/C Ratio		0.18			0.18			0.77			0.77	
Clearance Time (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		254			244			881			1106	
v/s Ratio Prot								0.57			c0.59	
v/s Ratio Perm		0.08			c0.10							
v/c Ratio		0.42			0.55			0.74			0.76	
Uniform Delay, d1		46.9			48.1			8.0			8.4	
Progression Factor		1.00			1.00			0.74			0.34	
Incremental Delay, d2		5.1			8.8			5.4			1.9	
Delay (s)		51.9			56.9			11.3			4.8	
Level of Service		D			E			B			A	
Approach Delay (s)		51.9			56.9			11.3			4.8	
Approach LOS		D			E			B			A	

Intersection Summary

HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1042: Ashland Ave. □ N Milwaukee Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗		↖			↗	
Volume (vph)	33	236	73	0	340	77	0	363	2	0	804	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	11	11	11	11	11	8	11	11	11
Total Lost time (s)	5.0	5.0			5.0	3.0		5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	0.99			1.00	0.90		1.00			1.00	
Flpb, ped/bikes	0.95	1.00			1.00	1.00		1.00			1.00	
Frt	1.00	0.96			1.00	0.85		1.00			1.00	
Flt Protected	0.95	1.00			1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1435	1592			1706	1312		1705			1535	
Flt Permitted	0.32	1.00			1.00	1.00		1.00			1.00	
Satd. Flow (perm)	488	1592			1706	1312		1705			1535	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.95	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	35	248	77	0	358	81	0	382	2	0	846	2
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	35	325	0	0	358	81	0	384	0	0	848	0
Confl. Peds. (#/hr)	49		18			49						5
Heavy Vehicles (%)	6%	5%	3%	0%	2%	1%	8%	2%	0%	5%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA			NA	custom		NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4					3 8						
Actuated Green, G (s)	32.0	32.0			37.0	37.0		83.0			83.0	
Effective Green, g (s)	32.0	32.0			37.0	37.0		83.0			83.0	
Actuated g/C Ratio	0.25	0.25			0.28	0.28		0.64			0.64	
Clearance Time (s)	5.0	5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)	120	391			485	373		1088			980	
v/s Ratio Prot		c0.20			c0.21			0.23			c0.55	
v/s Ratio Perm	0.07					0.06						
v/c Ratio	0.29	0.83			0.74	0.22		0.35			0.87	
Uniform Delay, d1	39.8	46.4			42.1	35.5		11.0			19.0	
Progression Factor	1.00	1.00			1.00	1.00		0.38			0.73	
Incremental Delay, d2	6.1	18.3			9.7	1.3		0.7			8.7	
Delay (s)	45.9	64.7			51.8	36.8		4.9			22.5	
Level of Service	D	E			D	D		A			C	
Approach Delay (s)		62.9			49.0			4.9			22.5	
Approach LOS		E			D			A			C	

Intersection Summary

HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1043: Ashland Ave. □ W Division St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘		↖	↗		↖	↗
Volume (vph)	104	461	29	251	716	15	0	408	144	0	680	183
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.66	1.00	1.00	0.56		1.00	0.68		1.00	0.67
Flpb, ped/bikes	0.86	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1421	3179	978	1577	3160	806		1464	1007		1550	866
Flt Permitted	0.34	1.00	1.00	0.33	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	508	3179	978	544	3160	806		1464	1007		1550	866
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.95	0.95	0.93	0.95	0.95
Adj. Flow (vph)	109	485	31	264	754	16	0	429	152	0	716	193
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	109	485	31	264	754	16	0	429	152	0	716	193
Confl. Peds. (#/hr)	169		130	130		169			244			272
Confl. Bikes (#/hr)						3						5
Heavy Vehicles (%)	0%	4%	0%	1%	1%	0%	7%	1%	0%	0%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								10			0	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	39.0	39.0	39.0	53.0	53.0	53.0		67.0	67.0		67.0	67.0
Effective Green, g (s)	39.0	39.0	39.0	53.0	53.0	53.0		67.0	67.0		67.0	67.0
Actuated g/C Ratio	0.30	0.30	0.30	0.41	0.41	0.41		0.52	0.52		0.52	0.52
Clearance Time (s)	5.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	152	953	293	309	1288	328		754	518		798	446
v/s Ratio Prot		0.15		c0.07	0.24			0.29			c0.46	
v/s Ratio Perm	0.21		0.03	c0.28		0.02			0.15			0.22
v/c Ratio	0.72	0.51	0.11	0.85	0.59	0.05		0.57	0.29		0.90	0.43
Uniform Delay, d1	40.6	37.6	32.9	32.3	30.0	23.3		21.6	18.0		28.4	19.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.10	1.14		0.49	0.44
Incremental Delay, d2	25.1	1.9	0.7	24.8	2.0	0.3		2.1	1.0		8.0	1.5
Delay (s)	65.7	39.5	33.6	57.1	31.9	23.5		25.9	21.5		21.8	10.0
Level of Service	E	D	C	E	C	C		C	C		C	B
Approach Delay (s)		43.8			38.2			24.8			19.3	
Approach LOS		D			D			C			B	

Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1049: Ashland Ave. □ W Augusta Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	325	58	94	523	62	0	463	130	0	743	181
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	9	10	9	11	11	11	11	11	11
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.94		0.96			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1565	1723	1426	1500	1663	1288		1272			1217	
Flt Permitted	0.14	1.00	1.00	0.37	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	233	1723	1426	580	1663	1288		1272			1217	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	126	342	61	99	551	65	0	487	137	0	782	191
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	126	342	61	99	551	65	0	624	0	0	973	0
Confl. Peds. (#/hr)	14		5	5		14			37			6
Heavy Vehicles (%)	2%	1%	0%	2%	1%	0%	0%	2%	1%	2%	4%	1%
Parking (#/hr)								20			30	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	48.0	48.0	48.0	48.0	48.0	48.0		76.0			76.0	
Effective Green, g (s)	48.0	48.0	48.0	48.0	48.0	48.0		76.0			76.0	
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37		0.58			0.58	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	86	636	526	214	614	475		743			711	
v/s Ratio Prot		0.20			0.33			0.49			c0.80	
v/s Ratio Perm	c0.54		0.04	0.17		0.05						
v/c Ratio	1.47	0.54	0.12	0.46	0.90	0.14		0.84			1.37	
Uniform Delay, d1	41.0	32.3	27.0	31.2	38.7	27.2		22.0			27.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			0.72	
Incremental Delay, d2	262.0	0.9	0.1	1.6	15.8	0.1		11.0			171.3	
Delay (s)	303.0	33.1	27.1	32.8	54.4	27.4		33.1			190.7	
Level of Service	F	C	C	C	D	C		C			F	
Approach Delay (s)		96.7			49.0			33.1			190.7	
Approach LOS		F			D			C			F	

Intersection Summary

HCM 2000 Control Delay	102.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1056: Ashland Ave. □ W Chicago Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕	↖		↕	↖
Volume (vph)	103	548	72	38	691	33	0	508	111	0	496	217
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.86		1.00	0.95
Flpb, ped/bikes	0.99	1.00		0.98	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1643	3215		1614	3246			1430	1279		1550	1404
Flt Permitted	0.20	1.00		0.27	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	353	3215		455	3246			1430	1279		1550	1404
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	108	577	76	40	727	35	0	535	117	0	522	228
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	108	653	0	40	762	0	0	535	117	0	522	228
Confl. Peds. (#/hr)	16		50	50		16			121			38
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	1%	0%	1%	1%	0%
Parking (#/hr)								14			0	
Turn Type	Perm	NA		Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	30.1	30.1		30.1	30.1			51.9	51.9		51.9	51.9
Effective Green, g (s)	30.1	30.1		30.1	30.1			51.9	51.9		51.9	51.9
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.58	0.58		0.58	0.58
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	118	1075		152	1085			824	737		893	809
v/s Ratio Prot		0.20			0.23			c0.37			0.34	
v/s Ratio Perm	c0.31			0.09					0.09			0.16
v/c Ratio	0.92	0.61		0.26	0.70			0.65	0.16		0.58	0.28
Uniform Delay, d1	28.7	25.0		21.9	26.1			12.9	8.9		12.2	9.6
Progression Factor	1.00	1.00		1.00	1.00			0.65	0.68		1.00	1.00
Incremental Delay, d2	56.7	1.0		0.9	2.1			3.2	0.4		2.8	0.9
Delay (s)	85.4	26.0		22.8	28.1			11.5	6.4		15.0	10.5
Level of Service	F	C		C	C			B	A		B	B
Approach Delay (s)		34.4			27.9			10.6			13.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1062: Ashland Ave. □ W Erie St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	53	28	25	15	55	23	0	652	7	0	649	20
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		0.99			0.99			1.00			1.00	
Frt		0.97			0.97			1.00			1.00	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1524			1570			1462			1407	
Flt Permitted		0.83			0.95			1.00			1.00	
Satd. Flow (perm)		1302			1497			1462			1407	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	56	29	26	16	58	24	0	686	7	0	683	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	111	0	0	98	0	0	693	0	0	704	0
Confl. Peds. (#/hr)	8		16	16		8			11			8
Heavy Vehicles (%)	0%	7%	0%	7%	0%	0%	0%	1%	0%	2%	2%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								10	10		14	14
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.0			18.0			64.0			64.0	
Effective Green, g (s)		18.0			18.0			64.0			64.0	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
Clearance Time (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		260			299			1039			1000	
v/s Ratio Prot								0.47			c0.50	
v/s Ratio Perm		c0.09			0.07							
v/c Ratio		0.43			0.33			0.67			0.70	
Uniform Delay, d1		31.5			30.8			7.1			7.5	
Progression Factor		1.00			1.00			0.60			1.18	
Incremental Delay, d2		5.1			2.9			2.3			3.9	
Delay (s)		36.5			33.7			6.6			12.8	
Level of Service		D			C			A			B	
Approach Delay (s)		36.5			33.7			6.6			12.8	
Approach LOS		D			C			A			B	

Intersection Summary

HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1066: Ashland Ave. □ W Grand Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↑	↗		↑	↗
Volume (vph)	156	584	92	82	676	104	0	531	50	0	498	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00			1.00	0.95		1.00	0.89
Flpb, ped/bikes	1.00	1.00		0.96	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1564	2998		1526	3042			1430	1401		1535	1169
Flt Permitted	0.18	1.00		0.25	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	289	2998		401	3042			1430	1401		1535	1169
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	164	615	97	86	712	109	0	559	53	0	524	75
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	164	712	0	86	821	0	0	559	53	0	524	75
Confl. Peds. (#/hr)	5		69	69		5			23			56
Heavy Vehicles (%)	2%	2%	1%	0%	3%	0%	10%	1%	0%	3%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								14			0	0
Turn Type	pm+pt	NA		Perm	NA			NA	Perm		NA	Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	39.0	38.0		28.0	28.0			44.0	44.0		44.0	44.0
Effective Green, g (s)	39.0	38.0		28.0	28.0			44.0	44.0		44.0	44.0
Actuated g/C Ratio	0.43	0.42		0.31	0.31			0.49	0.49		0.49	0.49
Clearance Time (s)	3.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	224	1265		124	946			699	684		750	571
v/s Ratio Prot	c0.06	0.24			c0.27			c0.39			0.34	
v/s Ratio Perm	0.26			0.21					0.04			0.06
v/c Ratio	0.73	0.56		0.69	0.87			0.80	0.08		0.70	0.13
Uniform Delay, d1	31.3	19.7		27.2	29.3			19.3	12.2		17.9	12.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.99	1.10
Incremental Delay, d2	11.7	1.8		27.4	10.6			9.3	0.2		4.0	0.4
Delay (s)	42.9	21.5		54.6	39.9			28.6	12.4		21.8	14.2
Level of Service	D	C		D	D			C	B		C	B
Approach Delay (s)		25.5			41.3			27.2			20.8	
Approach LOS		C			D			C			C	

Intersection Summary

HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1073: Ashland Ave. □ W Fulton St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	53	55	0	464	742	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11
Total Lost time (s)	3.0			3.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	0.97			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.93			1.00	0.99	
Flt Protected	0.98			1.00	1.00	
Satd. Flow (prot)	1458			1535	1489	
Flt Permitted	0.98			1.00	1.00	
Satd. Flow (perm)	1458			1535	1489	
Peak-hour factor, PHF	0.95	0.95	0.97	0.95	0.95	0.95
Adj. Flow (vph)	56	58	0	488	781	89
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	114	0	0	488	870	0
Confl. Peds. (#/hr)	18	3				
Heavy Vehicles (%)	2%	9%	21%	2%	4%	1%
Parking (#/hr)				0	0	
Turn Type	NA			NA	NA	
Protected Phases	4			2 10	6	
Permitted Phases						
Actuated Green, G (s)	16.0			88.0	80.0	
Effective Green, g (s)	16.0			88.0	80.0	
Actuated g/C Ratio	0.15			0.80	0.73	
Clearance Time (s)	3.0				3.0	
Lane Grp Cap (vph)	212			1228	1082	
v/s Ratio Prot	c0.08			c0.32	c0.58	
v/s Ratio Perm						
v/c Ratio	0.54			0.40	0.80	
Uniform Delay, d1	43.6			3.2	9.9	
Progression Factor	1.00			0.44	1.00	
Incremental Delay, d2	9.4			0.8	6.4	
Delay (s)	53.0			2.2	16.2	
Level of Service	D			A	B	
Approach Delay (s)	53.0			2.2	16.2	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1074: Ashland Ave. □ W Fulton St. (East)

8/8/2013



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↔			↕
Volume (vph)	36	61	464	79	0	758
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	10	10	11	11	11	11
Total Lost time (s)	3.0		3.0			3.0
Lane Util. Factor	1.00		1.00			1.00
Frbp, ped/bikes	0.87		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		0.98			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1226		1507			1439
Flt Permitted	0.98		1.00			1.00
Satd. Flow (perm)	1226		1507			1439
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.99	0.95
Adj. Flow (vph)	38	64	488	83	0	798
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	102	0	571	0	0	798
Confl. Peds. (#/hr)	3	18				
Heavy Vehicles (%)	6%	7%	2%	1%	0%	4%
Parking (#/hr)			0			8
Turn Type	NA		NA			NA
Protected Phases	8		2			6 14
Permitted Phases						
Actuated Green, G (s)	16.0		80.0			88.0
Effective Green, g (s)	16.0		80.0			88.0
Actuated g/C Ratio	0.15		0.73			0.80
Clearance Time (s)	3.0		3.0			
Lane Grp Cap (vph)	178		1096			1151
v/s Ratio Prot	c0.08		0.38			c0.55
v/s Ratio Perm						
v/c Ratio	0.57		0.52			0.69
Uniform Delay, d1	43.8		6.6			4.9
Progression Factor	1.00		0.67			0.17
Incremental Delay, d2	12.7		1.2			2.1
Delay (s)	56.5		5.6			2.9
Level of Service	E		A			A
Approach Delay (s)	56.5		5.6			2.9
Approach LOS	E		A			A

Intersection Summary

HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1077: Ashland Ave. □ W Lake St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Volume (vph)	34	274	31	32	307	89	0	491	25	0	586	30
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	4.0
Lane Util. Factor		1.00			1.00			1.00			1.00	1.00
Frbp, ped/bikes		0.99			0.98			0.99			1.00	0.62
Flpb, ped/bikes		1.00			1.00			1.00			1.00	1.00
Frt		0.99			0.97			0.99			1.00	0.85
Flt Protected		0.99			1.00			1.00			1.00	1.00
Satd. Flow (prot)		1721			1686			1221			1689	819
Flt Permitted		0.92			0.96			1.00			1.00	1.00
Satd. Flow (perm)		1584			1617			1221			1689	819
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.95	0.95	0.93	0.95	0.95
Adj. Flow (vph)	36	288	33	34	323	94	0	517	26	0	617	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	357	0	0	451	0	0	543	0	0	617	32
Confl. Peds. (#/hr)	27		52	52		27			45			88
Confl. Bikes (#/hr)			2						2			
Heavy Vehicles (%)	3%	1%	0%	0%	1%	2%	0%	1%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								36	36			0
Turn Type	Perm	NA		Perm	NA			NA			NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8								6
Actuated Green, G (s)		40.0			40.0			62.0			62.0	62.0
Effective Green, g (s)		40.0			40.0			62.0			62.0	62.0
Actuated g/C Ratio		0.36			0.36			0.56			0.56	0.56
Clearance Time (s)		4.0			4.0			4.0			4.0	4.0
Lane Grp Cap (vph)		576			588			688			951	461
v/s Ratio Prot								c0.44			0.37	
v/s Ratio Perm		0.23			c0.28							0.04
v/c Ratio		0.62			0.77			0.79			0.65	0.07
Uniform Delay, d1		28.8			30.9			18.9			16.5	10.9
Progression Factor		1.00			1.00			0.36			0.62	0.56
Incremental Delay, d2		5.0			9.3			8.7			2.5	0.2
Delay (s)		33.7			40.1			15.5			12.6	6.3
Level of Service		C			D			B			B	A
Approach Delay (s)		33.7			40.1			15.5			12.3	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1079: Ashland Ave. □ W Washington Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↑↑	↗		↑↑			↑↑	
Volume (vph)	0	0	0	20	251	21	0	583	0	0	662	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	10	10	10	11	11	11	11	11	11
Total Lost time (s)				4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor				1.00	0.95	1.00		0.95			0.95	
Frbp, ped/bikes				1.00	1.00	0.98		1.00			0.99	
Flpb, ped/bikes				0.99	1.00	1.00		1.00			1.00	
Frt				1.00	1.00	0.85		1.00			0.98	
Flt Protected				0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)				1585	3160	1401		3079			2759	
Flt Permitted				0.95	1.00	1.00		1.00			1.00	
Satd. Flow (perm)				1585	3160	1401		3079			2759	
Peak-hour factor, PHF	0.91	0.97	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	0	0	0	21	264	22	0	614	0	0	697	104
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	21	264	22	0	614	0	0	801	0
Confl. Peds. (#/hr)			5	5		5			27			44
Confl. Bikes (#/hr)			2						1			1
Heavy Vehicles (%)	9%	0%	0%	0%	1%	0%	3%	2%	0%	0%	3%	0%
Parking (#/hr)								0			26	
Turn Type				Perm	NA	Perm		NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8		8						
Actuated Green, G (s)				31.0	31.0	31.0		71.0			71.0	
Effective Green, g (s)				31.0	31.0	31.0		71.0			71.0	
Actuated g/C Ratio				0.28	0.28	0.28		0.65			0.65	
Clearance Time (s)				4.0	4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)				446	890	394		1987			1780	
v/s Ratio Prot					c0.08			0.20			c0.29	
v/s Ratio Perm				0.01		0.02						
v/c Ratio				0.05	0.30	0.06		0.31			0.45	
Uniform Delay, d1				28.7	31.0	28.8		8.6			9.7	
Progression Factor				1.00	1.00	1.00		0.21			0.82	
Incremental Delay, d2				0.2	0.9	0.3		0.4			0.7	
Delay (s)				28.9	31.8	29.1		2.2			8.7	
Level of Service				C	C	C		A			A	
Approach Delay (s)		0.0			31.4			2.2			8.7	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.4								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			110.0								Sum of lost time (s)	8.0
Intersection Capacity Utilization			49.0%								ICU Level of Service	A
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis
 1080: Ashland Ave. □ W Warren Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕↕			↕↕	
Volume (vph)	46	338	71	0	0	0	0	570	36	0	562	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						0.95			0.95	
Frbp, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.98						0.99			1.00	
Flt Protected		1.00						1.00			1.00	
Satd. Flow (prot)		2953						2741			2614	
Flt Permitted		1.00						1.00			1.00	
Satd. Flow (perm)		2953						2741			2614	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.96	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	48	356	75	0	0	0	0	600	38	0	592	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	479	0	0	0	0	0	638	0	0	592	0
Confl. Peds. (#/hr)			2						19			30
Confl. Bikes (#/hr)									3			3
Heavy Vehicles (%)	0%	1%	2%	0%	0%	0%	0%	2%	0%	3%	3%	0%
Parking (#/hr)								0			18	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		43.0						59.0			59.0	
Effective Green, g (s)		43.0						59.0			59.0	
Actuated g/C Ratio		0.39						0.54			0.54	
Clearance Time (s)		4.0						4.0			4.0	
Lane Grp Cap (vph)		1154						1470			1402	
v/s Ratio Prot								c0.23			0.23	
v/s Ratio Perm		0.16										
v/c Ratio		0.42						0.43			0.42	
Uniform Delay, d1		24.4						15.4			15.3	
Progression Factor		1.00						0.58			0.87	
Incremental Delay, d2		1.1						0.8			0.9	
Delay (s)		25.5						9.7			14.2	
Level of Service		C						A			B	
Approach Delay (s)		25.5			0.0			9.7			14.2	
Approach LOS		C			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1082: Ashland Ave. □ W Madison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	614	84	14	828	208	0	485	4	0	591	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		2.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frbp, ped/bikes	1.00	0.98		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.97	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.97			1.00			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1587	2957		1548	2963			3105			3005	
Flt Permitted	0.17	1.00		0.30	1.00			1.00			1.00	
Satd. Flow (perm)	278	2957		493	2963			3105			3005	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.99	0.95	0.95	0.99	0.95	0.95
Adj. Flow (vph)	46	646	88	15	872	219	0	511	4	0	622	46
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	46	734	0	15	1091	0	0	515	0	0	668	0
Confl. Peds. (#/hr)	31		74	74		31			23			27
Confl. Bikes (#/hr)						3			1			2
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%	17%	1%	0%	5%	3%	2%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		custom	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			3	8							
Actuated Green, G (s)	52.0	52.0		63.0	61.0			41.0			41.0	
Effective Green, g (s)	52.0	52.0		63.0	61.0			41.0			41.0	
Actuated g/C Ratio	0.47	0.47		0.57	0.55			0.37			0.37	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	131	1397		282	1643			1157			1120	
v/s Ratio Prot		0.25			c0.37			0.17			c0.22	
v/s Ratio Perm	0.17			0.03								
v/c Ratio	0.35	0.53		0.05	0.66			0.45			0.60	
Uniform Delay, d1	18.3	20.3		10.4	17.3			25.9			27.8	
Progression Factor	1.00	1.00		1.00	1.00			0.64			0.69	
Incremental Delay, d2	7.3	1.4		0.4	2.1			1.0			2.2	
Delay (s)	25.6	21.8		10.7	19.4			17.6			21.4	
Level of Service	C	C		B	B			B			C	
Approach Delay (s)		22.0			19.3			17.6			21.4	
Approach LOS		C			B			B			C	

Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1083: Ashland Ave. □ W Ogden Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↗			↗	
Volume (vph)	172	742	0	204	640	0	0	367	168	0	396	76
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0		3.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			0.99			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.95			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1708	3353		1636	3241			3076			2936	
Flt Permitted	0.36	1.00		0.29	1.00			1.00			1.00	
Satd. Flow (perm)	638	3353		495	3241			3076			2936	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.99	0.95	0.95	0.99	0.95	0.95
Adj. Flow (vph)	181	781	0	215	674	0	0	386	177	0	417	80
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	181	781	0	215	674	0	0	563	0	0	497	0
Confl. Peds. (#/hr)	3		7	7		3			13			22
Confl. Bikes (#/hr)			1			3			3			5
Heavy Vehicles (%)	0%	2%	0%	1%	2%	0%	0%	2%	0%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	3	0
Parking (#/hr)									0		0	
Turn Type	Perm	NA		pm+pt	NA			NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	57.0	57.0		71.0	70.0			32.0			32.0	
Effective Green, g (s)	57.0	57.0		71.0	70.0			32.0			32.0	
Actuated g/C Ratio	0.52	0.52		0.65	0.64			0.29			0.29	
Clearance Time (s)	4.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	330	1737		423	2062			894			854	
v/s Ratio Prot		0.23		c0.05	0.21			c0.18			0.17	
v/s Ratio Perm	c0.28			0.28								
v/c Ratio	0.55	0.45		0.51	0.33			0.63			0.58	
Uniform Delay, d1	17.8	16.6		18.0	9.2			33.9			33.3	
Progression Factor	1.00	1.00		1.00	1.00			0.40			0.34	
Incremental Delay, d2	6.4	0.8		4.3	0.4			3.2			2.4	
Delay (s)	24.3	17.5		22.3	9.6			16.9			13.8	
Level of Service	C	B		C	A			B			B	
Approach Delay (s)		18.8			12.7			16.9			13.8	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1084: Ashland Ave. □ W Monroe St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	0	50	34	52	52	20	0	540	20	0	454	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frb, ped/bikes		0.98			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.95			0.98			0.99			1.00	
Flt Protected		1.00			0.98			1.00			1.00	
Satd. Flow (prot)		1561			1572			2858			3019	
Flt Permitted		1.00			0.86			1.00			1.00	
Satd. Flow (perm)		1561			1378			2858			3019	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	53	36	55	55	21	0	568	21	0	478	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	89	0	0	131	0	0	589	0	0	479	0
Confl. Peds. (#/hr)	7		17	17		7			15			18
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	5%	0%	2%	5%	1%	4%	0%
Parking (#/hr)								24	24		0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		38.0			38.0			64.0			64.0	
Effective Green, g (s)		38.0			38.0			64.0			64.0	
Actuated g/C Ratio		0.35			0.35			0.58			0.58	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		539			476			1662			1756	
v/s Ratio Prot		0.06						0.21			0.16	
v/s Ratio Perm					0.10							
v/c Ratio		0.17			0.28			0.35			0.27	
Uniform Delay, d1		25.0			26.0			12.1			11.4	
Progression Factor		1.00			1.00			0.33			0.43	
Incremental Delay, d2		0.7			1.4			0.6			0.3	
Delay (s)		25.6			27.5			4.6			5.2	
Level of Service		C			C			A			A	
Approach Delay (s)		25.6			27.5			4.6			5.2	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1085: Ashland Ave. □ W Adams St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕↕			↕↕			↕↕	
Volume (vph)	0	0	0	68	144	83	0	506	0	0	645	45
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			0.95			0.95	
Frbp, ped/bikes					0.98			1.00			0.99	
Flpb, ped/bikes					1.00			1.00			1.00	
Frt					0.96			1.00			0.99	
Flt Protected					0.99			1.00			1.00	
Satd. Flow (prot)					2939			2642			2908	
Flt Permitted					0.99			1.00			1.00	
Satd. Flow (perm)					2939			2642			2908	
Peak-hour factor, PHF	0.91	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	72	152	87	0	533	0	0	679	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	311	0	0	533	0	0	726	0
Confl. Peds. (#/hr)			8	8		32			17			33
Confl. Bikes (#/hr)						2			1			1
Heavy Vehicles (%)	6%	0%	0%	0%	1%	1%	0%	2%	0%	0%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								54			12	12
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					35.0			67.0			67.0	
Effective Green, g (s)					35.0			67.0			67.0	
Actuated g/C Ratio					0.32			0.61			0.61	
Clearance Time (s)					4.0			4.0			4.0	
Lane Grp Cap (vph)					935			1609			1771	
v/s Ratio Prot								0.20			c0.25	
v/s Ratio Perm					0.11							
v/c Ratio					0.33			0.33			0.41	
Uniform Delay, d1					28.6			10.5			11.2	
Progression Factor					1.00			0.28			0.63	
Incremental Delay, d2					1.0			0.5			0.7	
Delay (s)					29.6			3.5			7.7	
Level of Service					C			A			A	
Approach Delay (s)		0.0			29.6			3.5			7.7	
Approach LOS		A			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1086: Ashland Ave. □ W Jackson Blvd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕			↕↕	
Volume (vph)	62	228	109	0	0	0	0	638	90	0	472	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0					4.0			4.0	
Lane Util. Factor		0.95	1.00					0.95			0.95	
Frbp, ped/bikes		1.00	0.97					0.99			1.00	
Flpb, ped/bikes		1.00	1.00					1.00			1.00	
Frt		1.00	0.85					0.98			1.00	
Flt Protected		0.99	1.00					1.00			1.00	
Satd. Flow (prot)		3301	1472					3167			2889	
Flt Permitted		0.99	1.00					1.00			1.00	
Satd. Flow (perm)		3301	1472					3167			2889	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.88	0.95	0.92	0.95	0.95	0.88	0.95	0.95
Adj. Flow (vph)	65	240	115	0	0	0	0	672	95	0	497	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	305	115	0	0	0	0	767	0	0	497	0
Confl. Peds. (#/hr)	6		13				6		20			9
Heavy Vehicles (%)	0%	3%	1%	2%	0%	0%	2%	2%	1%	4%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)									0		20	
Turn Type	Perm	NA	Perm					NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4		4									
Actuated Green, G (s)		38.0	38.0					63.0			63.0	
Effective Green, g (s)		38.0	38.0					63.0			63.0	
Actuated g/C Ratio		0.35	0.35					0.57			0.57	
Clearance Time (s)		5.0	5.0					4.0			4.0	
Lane Grp Cap (vph)		1140	508					1813			1654	
v/s Ratio Prot								0.24			0.17	
v/s Ratio Perm		0.09	0.08									
v/c Ratio		0.27	0.23					0.42			0.30	
Uniform Delay, d1		26.0	25.6					13.3			12.1	
Progression Factor		1.00	1.00					0.62			0.49	
Incremental Delay, d2		0.6	1.0					0.7			0.4	
Delay (s)		26.5	26.6					8.8			6.4	
Level of Service		C	C					A			A	
Approach Delay (s)		26.6			0.0			8.8			6.4	
Approach LOS		C			A			A			A	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1088: Ashland Ave. □ W Van Buren St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations				↙	↕	↗	↙	↕			↕	↗	
Volume (vph)	0	0	0	292	340	185	337	522	0	0	673	129	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	11	11	11	11	11	11	11	11	11	
Total Lost time (s)				4.0	4.0	4.0	4.0	4.0			4.0		
Lane Util. Factor				0.91	0.91	1.00	1.00	0.95			0.95		
Frbp, ped/bikes				1.00	1.00	0.97	1.00	1.00			0.99		
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00		
Frt				1.00	1.00	0.85	1.00	1.00			0.98		
Flt Protected				0.95	0.99	1.00	0.95	1.00			1.00		
Satd. Flow (prot)				1475	3026	1396	1621	3079			2955		
Flt Permitted				0.95	0.99	1.00	0.95	1.00			1.00		
Satd. Flow (perm)				1475	3026	1396	1621	3079			2955		
Peak-hour factor, PHF	0.91	0.99	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.99	0.95	0.95	
Adj. Flow (vph)	0	0	0	307	358	195	355	549	0	0	708	136	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	215	450	195	355	549	0	0	844	0	
Confl. Peds. (#/hr)						8	15		9			15	
Confl. Bikes (#/hr)						3			1			9	
Heavy Vehicles (%)	7%	0%	0%	2%	4%	3%	2%	2%	0%	0%	3%	1%	
Parking (#/hr)								0			0		
Turn Type				Split	NA	Perm	Prot	NA			NA		
Protected Phases				8	8		5	5 6			6 16		
Permitted Phases						8							
Actuated Green, G (s)				21.0	21.0	21.0	38.0	57.0			39.0		
Effective Green, g (s)				21.0	21.0	21.0	38.0	57.0			37.0		
Actuated g/C Ratio				0.19	0.19	0.19	0.35	0.52			0.34		
Clearance Time (s)				4.0	4.0	4.0	4.0						
Lane Grp Cap (vph)				281	577	266	559	1595			993		
v/s Ratio Prot				0.15	c0.15		c0.22	0.18			c0.29		
v/s Ratio Perm						0.14							
v/c Ratio				0.77	0.78	0.73	0.64	0.34			0.85		
Uniform Delay, d1				42.2	42.3	41.9	30.2	15.5			33.9		
Progression Factor				1.00	1.00	1.00	0.50	0.43			0.70		
Incremental Delay, d2				17.9	10.0	16.4	2.4	0.3			9.0		
Delay (s)				60.0	52.3	58.2	17.6	7.0			32.8		
Level of Service				E	D	E	B	A			C		
Approach Delay (s)		0.0			55.6			11.2			32.8		
Approach LOS		A			E			B			C		
Intersection Summary													
HCM 2000 Control Delay			32.8		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			110.0		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			71.4%		ICU Level of Service					C			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1089: Ashland Ave. □ W Congress Pkwy

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕↕		↗	↕↕	
Volume (vph)	192	268	258	0	0	0	0	732	322	256	609	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00					0.95		1.00	0.95	
Frbp, ped/bikes		1.00	1.00					0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00		1.00	1.00	
Frt		1.00	0.85					0.95		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		3290	1471					2911		1637	3031	
Flt Permitted		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		3290	1471					2911		1637	3031	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.96	0.95	0.96	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	202	282	272	0	0	0	0	771	339	269	641	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	484	272	0	0	0	0	1110	0	269	641	0
Confl. Peds. (#/hr)									3	3		2
Heavy Vehicles (%)	3%	1%	4%	1%	0%	0%	0%	2%	1%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	Split	NA	Perm					NA		Prot	NA	
Protected Phases	4	4						2 12		1	1 2	
Permitted Phases			4									
Actuated Green, G (s)		26.0	26.0					44.0		28.0	56.0	
Effective Green, g (s)		26.0	26.0					42.0		28.0	56.0	
Actuated g/C Ratio		0.24	0.24					0.38		0.25	0.51	
Clearance Time (s)		4.0	4.0							4.0		
Lane Grp Cap (vph)		777	347					1111		416	1543	
v/s Ratio Prot		0.15						c0.38		c0.16	0.21	
v/s Ratio Perm			c0.18									
v/c Ratio		0.62	0.78					1.00		0.65	0.42	
Uniform Delay, d1		37.6	39.4					34.0		36.6	16.8	
Progression Factor		1.00	1.00					0.74		0.73	0.64	
Incremental Delay, d2		3.7	16.1					22.7		4.5	0.5	
Delay (s)		41.4	55.5					47.9		31.2	11.2	
Level of Service		D	E					D		C	B	
Approach Delay (s)		46.4			0.0			47.9			17.1	
Approach LOS		D			A			D			B	
Intersection Summary												
HCM 2000 Control Delay			37.4					HCM 2000 Level of Service			D	
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			110.0					Sum of lost time (s)		16.0		
Intersection Capacity Utilization			71.4%					ICU Level of Service		C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1090: Ashland Ave. □ W Harrison St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕			↕	
Volume (vph)	280	308	161	60	164	54	0	1018	84	0	689	102
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0		5.0	5.0			5.0			5.0	
Lane Util. Factor	0.91	0.91		1.00	0.95			0.95			0.95	
Frbp, ped/bikes	1.00	0.97		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.95	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.96			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1488	2897		1521	2877			3041			2960	
Flt Permitted	0.50	0.92		0.44	1.00			1.00			1.00	
Satd. Flow (perm)	778	2663		705	2877			3041			2960	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	295	324	169	63	173	57	0	1072	88	0	725	107
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	248	540	0	63	230	0	0	1160	0	0	832	0
Confl. Peds. (#/hr)	29		84	84		29			36			18
Confl. Bikes (#/hr)			1			2			3			1
Heavy Vehicles (%)	0%	0%	0%	0%	7%	0%	0%	1%	2%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	pm+pt	NA		Perm	NA			NA			NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	43.0	43.0		21.0	21.0			57.0			57.0	
Effective Green, g (s)	43.0	43.0		21.0	21.0			57.0			57.0	
Actuated g/C Ratio	0.39	0.39		0.19	0.19			0.52			0.52	
Clearance Time (s)	3.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	426	1081		134	549			1575			1533	
v/s Ratio Prot	c0.10	0.09			0.08			c0.38			0.28	
v/s Ratio Perm	c0.13	0.11		0.09								
v/c Ratio	0.58	0.50		0.47	0.42			0.74			0.54	
Uniform Delay, d1	24.6	25.4		39.6	39.1			20.6			17.8	
Progression Factor	1.00	1.00		1.00	1.00			0.71			1.29	
Incremental Delay, d2	5.7	1.6		11.4	2.3			2.8			1.2	
Delay (s)	30.3	27.0		50.9	41.5			17.5			24.1	
Level of Service	C	C		D	D			B			C	
Approach Delay (s)		28.0			43.5			17.5			24.1	
Approach LOS		C			D			B			C	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1091: Ashland Ave. □ W Flourney St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	0	91	0	0	4	0	825	4	0	723	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	12	12	12	11	11	11	11	11	11
Total Lost time (s)	5.0		5.0		5.0			4.0			4.0	
Lane Util. Factor	0.97		1.00		1.00			0.95			0.95	
Frbp, ped/bikes	1.00		0.98		0.98			1.00			1.00	
Flpb, ped/bikes	0.99		1.00		1.00			1.00			1.00	
Frt	1.00		0.85		0.86			1.00			1.00	
Flt Protected	0.95		1.00		1.00			1.00			1.00	
Satd. Flow (prot)	3077		1400		1533			3046			3064	
Flt Permitted	0.76		1.00		1.00			1.00			1.00	
Satd. Flow (perm)	2446		1400		1533			3046			3064	
Peak-hour factor, PHF	0.95	0.91	0.95	0.95	0.91	0.95	0.91	0.95	0.95	0.91	0.95	0.95
Adj. Flow (vph)	379	0	96	0	0	4	0	868	4	0	761	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	379	0	96	0	4	0	0	872	0	0	781	0
Confl. Peds. (#/hr)	3		6	6		3			18			11
Confl. Bikes (#/hr)									2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	0%
Parking (#/hr)								0			0	
Turn Type	custom		custom	Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	37.0		37.0		37.0			64.0			64.0	
Effective Green, g (s)	37.0		37.0		37.0			64.0			64.0	
Actuated g/C Ratio	0.34		0.34		0.34			0.58			0.58	
Clearance Time (s)	5.0		5.0		5.0			4.0			4.0	
Lane Grp Cap (vph)	822		470		515			1772			1782	
v/s Ratio Prot					0.00			c0.29			0.25	
v/s Ratio Perm	c0.15		0.07									
v/c Ratio	0.46		0.20		0.01			0.49			0.44	
Uniform Delay, d1	28.7		26.0		24.3			13.5			12.9	
Progression Factor	1.00		1.00		1.00			0.37			0.61	
Incremental Delay, d2	1.9		1.0		0.0			0.7			0.7	
Delay (s)	30.5		27.0		24.3			5.8			8.5	
Level of Service	C		C		C			A			A	
Approach Delay (s)		29.8			24.3			5.8			8.5	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1092: Ashland Ave. □ W Polk St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	220	60	99	14	16	43	0	771	11	0	785	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frbp, ped/bikes		0.94			0.94			1.00			0.99	
Flpb, ped/bikes		0.95			0.98			1.00			1.00	
Frt		0.96			0.92			1.00			1.00	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1409			1394			3044			2998	
Flt Permitted		0.78			0.92			1.00			1.00	
Satd. Flow (perm)		1136			1291			3044			2998	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	63	104	15	17	45	0	812	12	0	826	27
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	399	0	0	77	0	0	824	0	0	853	0
Confl. Peds. (#/hr)	61		136	136		61			46			41
Confl. Bikes (#/hr)			10			6			8			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	1%	2%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		58.0			58.0			44.0			44.0	
Effective Green, g (s)		58.0			58.0			44.0			44.0	
Actuated g/C Ratio		0.53			0.53			0.40			0.40	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		598			680			1217			1199	
v/s Ratio Prot								0.27			c0.28	
v/s Ratio Perm		c0.35			0.06							
v/c Ratio		0.67			0.11			0.68			0.71	
Uniform Delay, d1		19.0			13.1			27.2			27.7	
Progression Factor		1.00			1.00			0.55			0.59	
Incremental Delay, d2		5.8			0.3			2.8			3.3	
Delay (s)		24.8			13.4			17.8			19.7	
Level of Service		C			B			B			B	
Approach Delay (s)		24.8			13.4			17.8			19.7	
Approach LOS		C			B			B			B	

Intersection Summary

HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1093: Ashland Ave. □ W Taylor St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	296	79	52	163	58	0	597	144	0	585	157
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95			0.95	
Frbp, ped/bikes	1.00	1.00	0.90	1.00	1.00	0.75		0.96			0.92	
Flpb, ped/bikes	0.83	1.00	1.00	0.96	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1318	1631	1280	1525	1615	1044		2834			2720	
Flt Permitted	0.60	1.00	1.00	0.44	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	835	1631	1280	702	1615	1044		2834			2720	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	109	312	83	55	172	61	0	628	152	0	616	165
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	109	312	83	55	172	61	0	780	0	0	781	0
Confl. Peds. (#/hr)	152		57	57		152			40			77
Confl. Bikes (#/hr)			8			3			3			2
Heavy Vehicles (%)	0%	3%	0%	0%	4%	3%	0%	3%	0%	6%	2%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	3	0	0	3	0
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	43.0	43.0	43.0	43.0	43.0	43.0		58.0			58.0	
Effective Green, g (s)	43.0	43.0	43.0	43.0	43.0	43.0		58.0			58.0	
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39		0.53			0.53	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		5.0			5.0	
Lane Grp Cap (vph)	326	637	500	274	631	408		1494			1434	
v/s Ratio Prot		c0.19			0.11			0.28			c0.29	
v/s Ratio Perm	0.13		0.06	0.08		0.06						
v/c Ratio	0.33	0.49	0.17	0.20	0.27	0.15		0.52			0.54	
Uniform Delay, d1	23.5	25.2	21.8	22.1	22.8	21.7		17.0			17.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.37			0.49	
Incremental Delay, d2	2.7	2.7	0.7	1.6	1.1	0.8		1.0			1.1	
Delay (s)	26.2	27.9	22.5	23.8	23.9	22.4		24.3			9.5	
Level of Service	C	C	C	C	C	C		C			A	
Approach Delay (s)		26.7			23.6			24.3			9.5	
Approach LOS		C			C			C			A	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1094: Ashland Ave. □ W Roosevelt Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘		↖	↗		↖	↗
Volume (vph)	136	1492	288	169	797	105	0	463	106	0	642	114
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.88	1.00	1.00	0.90		1.00	0.90		1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1575	3160	1261	1596	3099	1254		1550	1180		1673	1195
Flt Permitted	0.20	1.00	1.00	0.09	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	339	3160	1261	148	3099	1254		1550	1180		1673	1195
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	143	1571	303	178	839	111	0	487	112	0	676	120
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	143	1571	303	178	839	111	0	487	112	0	676	120
Confl. Peds. (#/hr)	76		47	47		76			78			62
Confl. Bikes (#/hr)			4			3			1			6
Heavy Vehicles (%)	1%	1%	0%	0%	3%	2%	5%	1%	0%	3%	4%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0			0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	59.0	49.0	49.0	52.4	45.4	45.4		41.0	41.0		41.0	41.0
Effective Green, g (s)	59.0	49.0	49.0	52.4	45.4	45.4		41.0	41.0		41.0	41.0
Actuated g/C Ratio	0.54	0.45	0.45	0.48	0.41	0.41		0.37	0.37		0.37	0.37
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	300	1407	561	162	1279	517		577	439		623	445
v/s Ratio Prot	c0.05	c0.50		c0.07	0.27			0.31			c0.40	
v/s Ratio Perm	0.21		0.24	0.45		0.09			0.09			0.10
v/c Ratio	0.48	1.12	0.54	1.10	0.66	0.21		0.84	0.26		1.09	0.27
Uniform Delay, d1	15.2	30.5	22.3	27.7	26.0	20.8		31.6	23.9		34.5	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.74	0.82		0.57	0.49
Incremental Delay, d2	2.5	62.7	3.7	99.6	2.6	0.9		9.3	0.9		59.7	1.3
Delay (s)	17.7	93.2	26.0	127.3	28.6	21.8		32.5	20.5		79.3	13.1
Level of Service	B	F	C	F	C	C		C	C		E	B
Approach Delay (s)		77.8			43.5			30.2			69.3	
Approach LOS		E			D			C			E	

Intersection Summary

HCM 2000 Control Delay	61.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1096: Ashland Ave. □ W 13th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↔			↔	
Volume (vph)	191	0	314	5	0	2	0	550	0	0	597	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.98			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.92			0.96			1.00			1.00	
Flt Protected		0.98			0.97			1.00			1.00	
Satd. Flow (prot)		1556			1654			1520			1517	
Flt Permitted		0.87			0.84			1.00			1.00	
Satd. Flow (perm)		1384			1443			1520			1517	
Peak-hour factor, PHF	0.95	0.91	0.95	0.95	0.91	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	201	0	331	5	0	2	0	579	0	0	628	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	532	0	0	7	0	0	579	0	0	637	0
Confl. Peds. (#/hr)	7		7	7		7			28			5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	0%	6%	0%	4%	3%	0%	0%	3%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		46.1			46.1			55.9			55.9	
Effective Green, g (s)		46.1			46.1			55.9			55.9	
Actuated g/C Ratio		0.42			0.42			0.51			0.51	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		580			604			772			770	
v/s Ratio Prot								0.38			c0.42	
v/s Ratio Perm		c0.38			0.00							
v/c Ratio		0.92			0.01			0.75			0.83	
Uniform Delay, d1		30.1			18.7			21.5			23.0	
Progression Factor		1.00			1.00			0.47			0.86	
Incremental Delay, d2		20.3			0.0			6.0			5.7	
Delay (s)		50.4			18.7			16.0			25.5	
Level of Service		D			B			B			C	
Approach Delay (s)		50.4			18.7			16.0			25.5	
Approach LOS		D			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			29.9								HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			110.0								Sum of lost time (s)	8.0
Intersection Capacity Utilization			72.4%								ICU Level of Service	C
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1098: Ashland Ave. □ W 14th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	0	0	198	16	0	6	0	475	0	0	581	29
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.91			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			0.97			1.00			1.00	
Frt		0.86			0.96			1.00			0.99	
Flt Protected		1.00			0.96			1.00			1.00	
Satd. Flow (prot)		1399			1624			1372			1520	
Flt Permitted		1.00			0.80			1.00			1.00	
Satd. Flow (perm)		1399			1351			1372			1520	
Peak-hour factor, PHF	0.91	0.91	0.95	0.95	0.91	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	0	0	208	17	0	6	0	500	0	0	612	31
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	208	0	0	23	0	0	500	0	0	643	0
Confl. Peds. (#/hr)			24	24					12			14
Confl. Bikes (#/hr)			6						5			5
Heavy Vehicles (%)	7%	0%	1%	0%	0%	0%	2%	4%	0%	4%	2%	0%
Parking (#/hr)								16			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		29.0			29.0			73.0			73.0	
Effective Green, g (s)		29.0			29.0			73.0			73.0	
Actuated g/C Ratio		0.26			0.26			0.66			0.66	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		368			356			910			1008	
v/s Ratio Prot		c0.15						0.36			c0.42	
v/s Ratio Perm					0.02							
v/c Ratio		0.57			0.06			0.55			0.64	
Uniform Delay, d1		35.0			30.3			9.8			10.8	
Progression Factor		1.00			1.00			0.83			0.66	
Incremental Delay, d2		6.2			0.3			1.9			2.0	
Delay (s)		41.2			30.7			10.1			9.1	
Level of Service		D			C			B			A	
Approach Delay (s)		41.2			30.7			10.1			9.1	
Approach LOS		D			C			B			A	

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1103: Ashland Ave. □ W 18th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↑	↗		↑	↗
Volume (vph)	102	428	160	138	390	78	0	681	125	0	522	63
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.83	1.00	1.00	0.59		1.00	0.76		1.00	0.67
Flpb, ped/bikes	0.86	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1380	1663	1185	1511	1647	811		1351	1097		1326	940
Flt Permitted	0.29	1.00	1.00	0.25	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	427	1663	1185	395	1647	811		1351	1097		1326	940
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	107	451	168	145	411	82	0	717	132	0	549	66
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	107	451	168	145	411	82	0	717	132	0	549	66
Confl. Peds. (#/hr)	156		59	59		156			58			79
Confl. Bikes (#/hr)			6			11						4
Heavy Vehicles (%)	0%	1%	0%	1%	2%	4%	1%	3%	2%	6%	5%	6%
Parking (#/hr)								20			20	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	39.0	39.0	39.0	39.0	39.0	39.0		60.0	60.0		60.0	60.0
Effective Green, g (s)	39.0	39.0	39.0	39.0	39.0	39.0		60.0	60.0		60.0	60.0
Actuated g/C Ratio	0.35	0.35	0.35	0.35	0.35	0.35		0.55	0.55		0.55	0.55
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	151	589	420	140	583	287		736	598		723	512
v/s Ratio Prot		0.27			0.25			c0.53			0.41	
v/s Ratio Perm	0.25		0.14	c0.37		0.10			0.12			0.07
v/c Ratio	0.71	0.77	0.40	1.04	0.70	0.29		0.97	0.22		0.76	0.13
Uniform Delay, d1	30.6	31.5	26.7	35.5	30.5	25.5		24.2	12.9		19.4	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.76	0.72		0.97	0.93
Incremental Delay, d2	24.4	9.2	2.8	85.9	7.0	2.5		19.8	0.5		6.6	0.5
Delay (s)	55.0	40.6	29.5	121.4	37.6	28.0		38.2	9.8		25.5	11.9
Level of Service	E	D	C	F	D	C		D	A		C	B
Approach Delay (s)		40.2			55.4			33.8			24.0	
Approach LOS		D			E			C			C	

Intersection Summary

HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1105: Ashland Ave. □ W 19th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	46	45	15	51	75	61	0	798	26	0	670	15
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.98			0.95			0.99			0.99	
Flpb, ped/bikes		0.97			0.97			1.00			1.00	
Frt		0.98			0.96			1.00			1.00	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1638			1568			1382			1269	
Flt Permitted		0.71			0.88			1.00			1.00	
Satd. Flow (perm)		1185			1403			1382			1269	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	48	47	16	54	79	64	0	840	27	0	705	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	111	0	0	197	0	0	867	0	0	721	0
Confl. Peds. (#/hr)	44		50	50		44			66			46
Confl. Bikes (#/hr)			2			4			6			4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	6%	3%	0%	0%	6%	7%
Parking (#/hr)								14			24	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		20.0			20.0			82.0			82.0	
Effective Green, g (s)		20.0			20.0			82.0			82.0	
Actuated g/C Ratio		0.18			0.18			0.75			0.75	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		215			255			1030			945	
v/s Ratio Prot								c0.63			0.57	
v/s Ratio Perm		0.09			c0.14							
v/c Ratio		0.52			0.77			0.84			0.76	
Uniform Delay, d1		40.6			42.8			9.6			8.3	
Progression Factor		1.00			1.00			0.24			0.76	
Incremental Delay, d2		8.6			20.0			4.7			4.0	
Delay (s)		49.2			62.9			7.0			10.3	
Level of Service		D			E			A			B	
Approach Delay (s)		49.2			62.9			7.0			10.3	
Approach LOS		D			E			A			B	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1107: Ashland Ave. □ W 21st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	39	78	27	148	99	30	0	725	51	0	646	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.99			0.99			1.00	
Flpb, ped/bikes		0.99			0.99			1.00			1.00	
Frt		0.97			0.99			0.99			1.00	
Flt Protected		0.99			0.97			1.00			1.00	
Satd. Flow (prot)		1700			1670			1331			1371	
Flt Permitted		0.86			0.70			1.00			1.00	
Satd. Flow (perm)		1477			1197			1331			1371	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	41	82	28	156	104	32	0	763	54	0	680	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	151	0	0	292	0	0	817	0	0	702	0
Confl. Peds. (#/hr)	33		17	17		33			18			20
Confl. Bikes (#/hr)			1			1			1			1
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%	0%	3%	2%	2%	6%	0%
Parking (#/hr)								20			12	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		28.6			28.6			73.4			73.4	
Effective Green, g (s)		28.6			28.6			73.4			73.4	
Actuated g/C Ratio		0.26			0.26			0.67			0.67	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		384			311			888			914	
v/s Ratio Prot								c0.61			0.51	
v/s Ratio Perm		0.10			c0.24							
v/c Ratio		0.39			0.94			0.92			0.77	
Uniform Delay, d1		33.5			39.8			15.8			12.5	
Progression Factor		1.00			1.00			0.30			1.03	
Incremental Delay, d2		1.4			35.9			2.0			4.0	
Delay (s)		34.9			75.7			6.7			16.8	
Level of Service		C			E			A			B	
Approach Delay (s)		34.9			75.7			6.7			16.8	
Approach LOS		C			E			A			B	

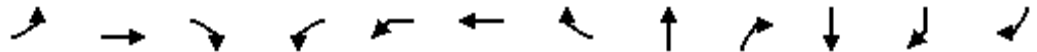
Intersection Summary

HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013

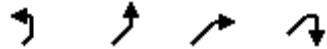


Movement	EBL	EBT	EBR	WBL2	WBL	WBT	WBR	NBT	NBR	SBT	SBR	SBR2
Lane Configurations												
Volume (vph)	81	301	87	84	172	451	45	620	97	555	104	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	12	11	10	11	12	11	11	11	11	11
Total Lost time (s)	4.0	4.0			3.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			1.00	0.95		1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	0.99			1.00	0.98		1.00	0.98	1.00	0.86	
Flpb, ped/bikes	0.89	1.00			1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.97			1.00	0.99		1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00			0.95	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (prot)	1415	3045			1451	3066		895	701	1442	1069	
Flt Permitted	0.45	1.00			0.26	1.00		1.00	1.00	1.00	1.00	
Satd. Flow (perm)	668	3045			398	3066		895	701	1442	1069	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	317	92	88	181	475	47	653	102	584	109	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	85	409	0	0	269	522	0	653	102	584	142	0
Confl. Peds. (#/hr)	99						99		6		53	
Confl. Bikes (#/hr)			2				6		6		1	
Heavy Vehicles (%)	0%	5%	2%	10%	10%	4%	3%	3%	8%	5%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	3	0
Parking (#/hr)								74	74	6	6	
Turn Type	Perm	NA		pm+pt	pm+pt	NA		NA	Perm	NA	Perm	
Protected Phases		4		3	3	8		2		6		
Permitted Phases	4			8	8				2		6	
Actuated Green, G (s)	19.9	19.9			29.9	29.9		53.0	53.0	53.0	53.0	
Effective Green, g (s)	19.9	19.9			29.9	29.9		53.0	53.0	53.0	53.0	
Actuated g/C Ratio	0.18	0.18			0.27	0.27		0.48	0.48	0.48	0.48	
Clearance Time (s)	4.0	4.0			3.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	120	550			175	833		431	337	694	515	
v/s Ratio Prot		0.13			c0.10	0.17		c0.73		0.41		
v/s Ratio Perm	0.13				c0.32				0.15		0.13	
v/c Ratio	0.71	0.74			1.54	0.63		1.52	0.30	0.84	0.28	
Uniform Delay, d1	42.3	42.6			38.3	35.2		28.5	17.3	24.8	17.0	
Progression Factor	1.00	1.00			1.00	1.00		0.97	0.96	0.73	0.82	
Incremental Delay, d2	17.4	5.4			268.2	1.5		241.9	2.0	6.2	0.2	
Delay (s)	59.7	48.0			306.5	36.6		269.7	18.7	24.3	14.1	
Level of Service	E	D			F	D		F	B	C	B	
Approach Delay (s)		50.0				128.4		235.8		22.3		
Approach LOS		D				F		F		C		

Intersection Summary		
HCM 2000 Control Delay	115.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.50	F
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	87.9%	15.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

HCM Signalized Intersection Capacity Analysis
 1109: S Blue Island Ave. □ Ashland Ave. □ W Cermak Rd.

8/8/2013



Movement	NEL2	NEL	NER	NER2
Lane Configurations				
Volume (vph)	4	97	159	47
Ideal Flow (vphpl)	1800	1800	1800	1800
Lane Width	11	11	12	12
Total Lost time (s)		4.0	4.0	
Lane Util. Factor		1.00	1.00	
Frbp, ped/bikes		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	
Frt		1.00	0.85	
Flt Protected		0.95	1.00	
Satd. Flow (prot)		1637	1424	
Flt Permitted		0.99	1.00	
Satd. Flow (perm)		1706	1424	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	102	167	49
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	106	216	0
Confl. Peds. (#/hr)				
Confl. Bikes (#/hr)				
Heavy Vehicles (%)	0%	1%	9%	2%
Bus Blockages (#/hr)	0	0	0	0
Parking (#/hr)				
Turn Type	Perm	NA	Perm	
Protected Phases		9		
Permitted Phases	9		9	
Actuated Green, G (s)		15.1	15.1	
Effective Green, g (s)		15.1	15.1	
Actuated g/C Ratio		0.14	0.14	
Clearance Time (s)		4.0	4.0	
Vehicle Extension (s)		3.0	3.0	
Lane Grp Cap (vph)		234	195	
v/s Ratio Prot				
v/s Ratio Perm		0.06	c0.15	
v/c Ratio		0.45	1.11	
Uniform Delay, d1		43.7	47.5	
Progression Factor		1.00	1.00	
Incremental Delay, d2		1.4	96.3	
Delay (s)		45.0	143.7	
Level of Service		D	F	
Approach Delay (s)		111.2		
Approach LOS		F		
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

1110: Ashland Ave. □ 2451 S Ashland Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	2	0	4	0	0	1	0	799	0	0	778	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		0.94			0.95			1.00			1.00	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.91			0.86			1.00			1.00	
Flt Protected		0.98			1.00			1.00			1.00	
Satd. Flow (prot)		1500			1473			1657			1722	
Flt Permitted		1.00			1.00			1.00			1.00	
Satd. Flow (perm)		1525			1473			1657			1722	
Peak-hour factor, PHF	0.95	0.94	0.95	0.95	0.94	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	2	0	4	0	0	1	0	841	0	0	819	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	1	0	0	841	0	0	820	0
Confl. Peds. (#/hr)	1		2	2		1			1			12
Confl. Bikes (#/hr)									2			4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	14%	5%	0%	25%	1%	0%
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		1.6			1.6			98.4			98.4	
Effective Green, g (s)		1.6			1.6			98.4			98.4	
Actuated g/C Ratio		0.01			0.01			0.89			0.89	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		22			21			1482			1540	
v/s Ratio Prot					0.00			c0.51			0.48	
v/s Ratio Perm		c0.00										
v/c Ratio		0.27			0.05			0.57			0.53	
Uniform Delay, d1		53.6			53.4			1.2			1.2	
Progression Factor		1.00			1.00			1.00			0.34	
Incremental Delay, d2		13.6			2.0			1.6			0.6	
Delay (s)		67.2			55.4			2.8			1.0	
Level of Service		E			E			A			A	
Approach Delay (s)		67.2			55.4			2.8			1.0	
Approach LOS		E			E			A			A	

Intersection Summary

HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1111: Ashland Ave. □ W 27th St.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	0	785	778	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)				5.0	5.0	
Lane Util. Factor				1.00	1.00	
Frbp, ped/bikes				1.00	1.00	
Flpb, ped/bikes				1.00	1.00	
Frt				1.00	1.00	
Flt Protected				1.00	1.00	
Satd. Flow (prot)				1689	1689	
Flt Permitted				1.00	1.00	
Satd. Flow (perm)				1689	1689	
Peak-hour factor, PHF	0.95	0.95	0.96	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	826	819	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	826	819	0
Confl. Peds. (#/hr)		10				16
Confl. Bikes (#/hr)						3
Heavy Vehicles (%)	0%	0%	50%	3%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	3
Turn Type		Perm		NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4				6
Actuated Green, G (s)				100.0	100.0	
Effective Green, g (s)				100.0	100.0	
Actuated g/C Ratio				1.00	1.00	
Clearance Time (s)				5.0	5.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				1689	1689	
v/s Ratio Prot				0.49	0.48	
v/s Ratio Perm						
v/c Ratio				0.49	0.48	
Uniform Delay, d1				0.0	0.0	
Progression Factor				1.00	1.00	
Incremental Delay, d2				0.8	1.0	
Delay (s)				0.8	1.0	
Level of Service				A	A	
Approach Delay (s)	0.0			0.8	1.0	
Approach LOS	A			A	A	

Intersection Summary

HCM 2000 Control Delay	0.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1112: Ashland Ave. □ W Marketplace Access Rd.

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	8	18	0	692	706	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	12	12	11	11	11	11
Total Lost time (s)	4.0	4.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.96		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1710	1255		1171	1187	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	1710	1255		1171	1187	
Peak-hour factor, PHF	0.95	0.95	0.92	0.95	0.95	0.95
Adj. Flow (vph)	8	19	0	728	743	5
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	8	19	0	728	748	0
Confl. Peds. (#/hr)		2				3
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	17%	29%	4%	4%	0%
Parking (#/hr)				40	38	
Turn Type	NA	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	4.9	4.9		86.1	86.1	
Effective Green, g (s)	4.9	4.9		86.1	86.1	
Actuated g/C Ratio	0.05	0.05		0.86	0.86	
Clearance Time (s)	4.0	4.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	83	61		1008	1022	
v/s Ratio Prot	0.00			0.62	c0.63	
v/s Ratio Perm		c0.02				
v/c Ratio	0.10	0.31		0.72	0.73	
Uniform Delay, d1	45.4	45.9		2.6	2.6	
Progression Factor	1.00	1.00		1.58	1.00	
Incremental Delay, d2	0.5	2.9		3.8	4.1	
Delay (s)	45.9	48.8		7.8	6.7	
Level of Service	D	D		A	A	
Approach Delay (s)	48.0			7.8	6.7	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1113: Ashland Ave. □ W 31st Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗		↔			↔		↖	↑	↗
Volume (vph)	292	0	158	15	0	15	0	313	15	15	638	160
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	4.0		4.0		4.0			12.0		2.0	12.0	12.0
Lane Util. Factor	1.00		1.00		1.00			1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00		1.00		0.98			0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00		1.00		1.00			1.00		0.96	1.00	1.00
Frt	1.00		0.85		0.93			0.99		1.00	1.00	0.85
Flt Protected	0.95		1.00		0.98			1.00		0.95	1.00	1.00
Satd. Flow (prot)	1605		1232		802			1584		797	1689	1371
Flt Permitted	0.95		1.00		0.98			1.00		0.52	1.00	1.00
Satd. Flow (perm)	1605		1232		802			1584		440	1689	1371
Peak-hour factor, PHF	0.95	0.96	0.95	0.95	0.96	0.95	0.96	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	307	0	166	16	0	16	0	329	16	16	672	168
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	307	0	166	0	32	0	0	345	0	16	672	168
Confl. Peds. (#/hr)	2						2			70	70	3
Confl. Bikes (#/hr)										2		2
Heavy Vehicles (%)	3%	0%	20%	100%	0%	100%	0%	4%	100%	100%	3%	5%
Turn Type	Split		Perm	Split	NA			NA		pm+pt	NA	Perm
Protected Phases	4	4		8	8			2		1	6	
Permitted Phases			4							6		6
Actuated Green, G (s)	24.0		24.0		4.8			46.8		51.2	51.2	51.2
Effective Green, g (s)	24.0		24.0		4.8			46.8		51.2	51.2	51.2
Actuated g/C Ratio	0.24		0.24		0.05			0.47		0.51	0.51	0.51
Clearance Time (s)	4.0		4.0		4.0			12.0		2.0	12.0	12.0
Vehicle Extension (s)	3.0		3.0		3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385		295		38			741		233	864	701
v/s Ratio Prot	c0.19				c0.04			0.22		0.00	c0.40	
v/s Ratio Perm			0.13							0.03		0.12
v/c Ratio	0.80		0.56		0.84			0.47		0.07	0.78	0.24
Uniform Delay, d1	35.7		33.4		47.2			18.1		12.2	19.8	13.6
Progression Factor	1.00		1.00		1.00			0.82		0.74	0.89	0.86
Incremental Delay, d2	15.7		7.6		85.4			1.6		0.1	5.5	0.6
Delay (s)	51.4		41.0		132.6			16.5		9.1	23.2	12.3
Level of Service	D		D		F			B		A	C	B
Approach Delay (s)		47.7			132.6			16.5			20.8	
Approach LOS		D			F			B			C	

Intersection Summary

HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1114: Ashland Ave. □ S Archer Ave.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑		↖	↑↑↑			↑			↑	
Volume (vph)	100	1049	115	178	991	47	0	301	99	0	454	99
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	10	11	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0		3.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00			1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00			0.98			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1651	4525		1635	4404			1406			1567	
Flt Permitted	0.18	1.00		0.11	1.00			1.00			1.00	
Satd. Flow (perm)	319	4525		183	4404			1406			1567	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	105	1104	121	187	1043	49	0	317	104	0	478	104
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	105	1225	0	187	1092	0	0	421	0	0	582	0
Confl. Peds. (#/hr)	24		69	69		24			65			25
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	0%	2%	4%	1%	3%	7%	100%	7%	3%	7%	9%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0			18
Turn Type	pm+pt	NA		pm+pt	NA			NA			NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	41.1	34.7		47.6	38.2			42.4			42.4	
Effective Green, g (s)	41.1	34.7		47.6	38.2			42.4			42.4	
Actuated g/C Ratio	0.41	0.35		0.48	0.38			0.42			0.42	
Clearance Time (s)	3.0	5.0		3.0	5.0			5.0			5.0	
Vehicle Extension (s)	5.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	216	1570		230	1682			596			664	
v/s Ratio Prot	0.03	0.27		c0.08	0.25			0.30			c0.37	
v/s Ratio Perm	0.17			c0.31								
v/c Ratio	0.49	0.78		0.81	0.65			0.71			0.88	
Uniform Delay, d1	19.1	29.2		19.8	25.4			23.7			26.4	
Progression Factor	1.00	1.00		1.00	1.00			0.87			0.63	
Incremental Delay, d2	3.6	2.6		19.3	2.0			6.7			11.0	
Delay (s)	22.6	31.8		39.1	27.4			27.4			27.7	
Level of Service	C	C		D	C			C			C	
Approach Delay (s)		31.1			29.1			27.4			27.7	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1115: Ashland Ave. □ W Robinson St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↖	↗	↖	↑			↗	↖	
Volume (vph)	0	0	0	116	63	8	166	343	27	0	476	81	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	14	12	12	11	12	11	11	11	11	11	11	
Total Lost time (s)					4.0	4.0	2.0	4.0			4.0		
Lane Util. Factor					1.00	1.00	1.00	1.00			1.00		
Frbp, ped/bikes					1.00	0.96	1.00	0.99			0.99		
Flpb, ped/bikes					0.98	1.00	1.00	1.00			1.00		
Frt					1.00	0.85	1.00	0.99			0.98		
Flt Protected					0.97	1.00	0.95	1.00			1.00		
Satd. Flow (prot)					1630	1472	1496	1608			1571		
Flt Permitted					0.97	1.00	0.35	1.00			1.00		
Satd. Flow (perm)					1630	1472	559	1608			1571		
Peak-hour factor, PHF	0.95	0.91	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.91	0.95	0.95	
Adj. Flow (vph)	0	0	0	122	66	8	175	361	28	0	501	85	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	188	8	175	389	0	0	586	0	
Confl. Peds. (#/hr)			10	10		6	22		14			22	
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%	10%	7%	0%	3%	8%	5%	
Turn Type				Perm	NA	Perm	pm+pt	NA			NA		
Protected Phases					8		5	2				6	
Permitted Phases				8		8	2						
Actuated Green, G (s)					16.3	16.3	77.7	75.7				63.7	
Effective Green, g (s)					16.3	16.3	77.7	75.7				63.7	
Actuated g/C Ratio					0.16	0.16	0.78	0.76				0.64	
Clearance Time (s)					4.0	4.0	2.0	4.0				4.0	
Vehicle Extension (s)					3.0	3.0	3.0	3.0				3.0	
Lane Grp Cap (vph)					265	239	528	1217				1000	
v/s Ratio Prot							c0.03	0.24				c0.37	
v/s Ratio Perm					0.12	0.01	0.22						
v/c Ratio					0.71	0.03	0.33	0.32				0.59	
Uniform Delay, d1					39.6	35.2	8.6	3.9				10.5	
Progression Factor					1.00	1.00	0.56	0.45				0.56	
Incremental Delay, d2					8.4	0.1	0.3	0.6				1.3	
Delay (s)					48.0	35.3	5.1	2.4				7.1	
Level of Service					D	D	A	A				A	
Approach Delay (s)		0.0			47.5			3.2				7.1	
Approach LOS		A			D			A				A	
Intersection Summary													
HCM 2000 Control Delay			11.4		HCM 2000 Level of Service						B		
HCM 2000 Volume to Capacity ratio			0.58										
Actuated Cycle Length (s)			100.0		Sum of lost time (s)					10.0			
Intersection Capacity Utilization			68.6%		ICU Level of Service						C		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1118: Ashland Ave. □ W 33rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	41	44	0	0	39	0	462	10	0	488	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00			1.00			1.00			1.00	
Frbp, ped/bikes	1.00	0.99			0.97			1.00			1.00	
Flpb, ped/bikes	0.99	1.00			1.00			1.00			1.00	
Frt	1.00	0.92			0.86			1.00			1.00	
Flt Protected	0.95	1.00			1.00			1.00			1.00	
Satd. Flow (prot)	1694	1606			1396			1064			1431	
Flt Permitted	0.73	1.00			1.00			1.00			1.00	
Satd. Flow (perm)	1302	1606			1396			1064			1431	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.95	0.92	0.95	0.95	0.93	0.95	0.95
Adj. Flow (vph)	17	43	46	0	0	41	0	486	11	0	514	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	17	89	0	0	41	0	0	497	0	0	515	0
Confl. Peds. (#/hr)	4		2			4			5			7
Confl. Bikes (#/hr)						1						2
Heavy Vehicles (%)	0%	0%	4%	2%	2%	8%	2%	6%	0%	14%	7%	0%
Parking (#/hr)								50				4
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)	20.0	20.0			20.0			72.0			72.0	
Effective Green, g (s)	20.0	20.0			20.0			72.0			72.0	
Actuated g/C Ratio	0.20	0.20			0.20			0.72			0.72	
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)	260	321			279			766			1030	
v/s Ratio Prot		c0.06			0.03			c0.47			0.36	
v/s Ratio Perm	0.01											
v/c Ratio	0.07	0.28			0.15			0.65			0.50	
Uniform Delay, d1	32.4	33.9			33.0			7.4			6.1	
Progression Factor	1.00	1.00			1.00			0.85			0.69	
Incremental Delay, d2	0.5	2.1			1.1			3.3			1.4	
Delay (s)	32.9	36.0			34.1			9.6			5.7	
Level of Service	C	D			C			A			A	
Approach Delay (s)		35.5			34.1			9.6			5.7	
Approach LOS		D			C			A			A	

Intersection Summary

HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1121: Ashland Ave. □ W 35th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	320	93	74	310	108	0	538	36	0	443	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.94		1.00	0.92
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1532	1570	1238	1515	1538	1220		1192	959		1193	984
Flt Permitted	0.33	1.00	1.00	0.35	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	526	1570	1238	560	1538	1220		1192	959		1193	984
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	63	337	98	78	326	114	0	566	38	0	466	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	63	337	98	78	337	103	0	566	38	0	466	38
Confl. Peds. (#/hr)	11		12	12		11			12			17
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	3%	7%	10%	4%	3%	6%	14%	8%	6%	17%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)								32	32		36	36
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	30.0	30.0	30.0	30.0	30.0	30.0		61.0	61.0		61.0	61.0
Effective Green, g (s)	30.0	30.0	30.0	30.0	30.0	30.0		61.0	61.0		61.0	61.0
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30		0.61	0.61		0.61	0.61
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	157	471	371	168	461	366		727	584		727	600
v/s Ratio Prot		0.21			c0.22			c0.47			0.39	
v/s Ratio Perm	0.12		0.08	0.14		0.08			0.04			0.04
v/c Ratio	0.40	0.72	0.26	0.46	0.73	0.28		0.78	0.07		0.64	0.06
Uniform Delay, d1	27.9	31.2	26.6	28.5	31.4	26.8		14.5	7.9		12.5	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.66	0.85		0.68	0.68
Incremental Delay, d2	7.5	9.0	1.7	9.0	9.8	1.9		7.3	0.2		3.9	0.2
Delay (s)	35.3	40.2	28.3	37.4	41.2	28.7		16.8	6.9		12.4	5.6
Level of Service	D	D	C	D	D	C		B	A		B	A
Approach Delay (s)		37.2			38.1			16.2			11.9	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1123: Ashland Ave. □ W 37th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↔			↔	
Volume (vph)	24	4	15	12	16	19	0	554	16	0	476	9
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			5.0			5.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.98			1.00			1.00	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.95			0.95			1.00			1.00	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1650			1583			1461			1488	
Flt Permitted		0.87			0.92			1.00			1.00	
Satd. Flow (perm)		1478			1469			1461			1488	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	4	16	13	17	20	0	583	17	0	501	9
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	45	0	0	50	0	0	600	0	0	510	0
Confl. Peds. (#/hr)	4					4						1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	11%	5%	7%	0%	19%	5%	0%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		8.9			8.9			82.1			82.1	
Effective Green, g (s)		8.9			8.9			82.1			82.1	
Actuated g/C Ratio		0.09			0.09			0.82			0.82	
Clearance Time (s)		4.0			4.0			5.0			5.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		131			130			1199			1221	
v/s Ratio Prot								c0.41			0.34	
v/s Ratio Perm		0.03			c0.03							
v/c Ratio		0.34			0.38			0.50			0.42	
Uniform Delay, d1		42.8			43.0			2.7			2.4	
Progression Factor		1.00			1.00			0.78			0.81	
Incremental Delay, d2		3.3			3.9			1.4			0.9	
Delay (s)		46.1			46.9			3.6			2.9	
Level of Service		D			D			A			A	
Approach Delay (s)		46.1			46.9			3.6			2.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1127: Ashland Ave. □ W Pershing Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘	↘	↑↑	↘		↑	↘		↑	↘
Volume (vph)	15	217	146	166	500	123	0	432	45	0	494	31
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00	1.00		1.00	0.98		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1653	3033	1394	1585	3119	1321		1398	1143		1374	1291
Flt Permitted	0.43	1.00	1.00	0.48	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	748	3033	1394	805	3119	1321		1398	1143		1374	1291
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	16	228	154	175	526	129	0	455	47	0	520	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	16	228	154	175	526	129	0	455	47	0	520	33
Confl. Peds. (#/hr)			3	3					4			4
Heavy Vehicles (%)	0%	9%	3%	4%	6%	12%	1%	12%	13%	16%	14%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	25.7	23.3	23.3	36.8	31.4	31.4		57.2	57.2		57.2	57.2
Effective Green, g (s)	25.7	23.3	23.3	36.8	31.4	31.4		57.2	57.2		57.2	57.2
Actuated g/C Ratio	0.26	0.23	0.23	0.37	0.31	0.31		0.57	0.57		0.57	0.57
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	213	706	324	378	979	414		799	653		785	738
v/s Ratio Prot	0.00	0.08		c0.05	c0.17			0.33			c0.38	
v/s Ratio Perm	0.02		0.11	0.12		0.10			0.04			0.03
v/c Ratio	0.08	0.32	0.48	0.46	0.54	0.31		0.57	0.07		0.66	0.04
Uniform Delay, d1	27.9	31.8	33.1	22.6	28.3	26.1		13.6	9.6		14.7	9.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.75	0.68
Incremental Delay, d2	0.2	1.2	4.9	0.9	2.1	2.0		2.9	0.2		2.0	0.0
Delay (s)	28.0	33.0	38.0	23.5	30.4	28.0		16.5	9.8		13.2	6.4
Level of Service	C	C	D	C	C	C		B	A		B	A
Approach Delay (s)		34.7			28.6			15.9			12.8	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1130: Ashland Ave. □ W 42nd St. (West)

8/8/2013



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	32	20	0	368	617	42
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width	11	12	11	11	11	11
Total Lost time (s)	5.0			3.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.95			1.00	0.99	
Flt Protected	0.97			1.00	1.00	
Satd. Flow (prot)	1556			1187	1652	
Flt Permitted	0.97			1.00	1.00	
Satd. Flow (perm)	1556			1187	1652	
Peak-hour factor, PHF	0.95	0.95	0.96	0.95	0.95	0.95
Adj. Flow (vph)	34	21	0	387	649	44
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	55	0	0	387	693	0
Confl. Peds. (#/hr)	4	1				6
Confl. Bikes (#/hr)						1
Heavy Vehicles (%)	0%	5%	0%	7%	4%	7%
Parking (#/hr)				34		
Turn Type	NA			NA	NA	
Protected Phases	4			2	9	6
Permitted Phases						
Actuated Green, G (s)	11.0			69.0	62.0	
Effective Green, g (s)	11.0			69.0	62.0	
Actuated g/C Ratio	0.12			0.77	0.69	
Clearance Time (s)	5.0				3.0	
Vehicle Extension (s)	8.0				3.0	
Lane Grp Cap (vph)	190			910	1138	
v/s Ratio Prot	c0.04			c0.33	c0.42	
v/s Ratio Perm						
v/c Ratio	0.29			0.43	0.61	
Uniform Delay, d1	35.9			3.6	7.5	
Progression Factor	1.00			0.34	1.00	
Incremental Delay, d2	3.6			0.3	2.4	
Delay (s)	39.5			1.5	9.9	
Level of Service	D			A	A	
Approach Delay (s)	39.5			1.5	9.9	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1131: Ashland Ave. □ W 42nd Pl.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↕	
Volume (vph)	8	0	22	0	11	5	0	361	1	0	376	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	8	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			3.0			3.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.90			0.96			1.00			0.99	
Flt Protected		0.99			1.00			1.00			1.00	
Satd. Flow (prot)		1599			1507			1491			1476	
Flt Permitted		0.93			1.00			1.00			1.00	
Satd. Flow (perm)		1510			1507			1491			1476	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	8	0	23	0	12	5	0	380	1	0	396	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	31	0	0	17	0	0	381	0	0	414	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	50%	2%	5%	0%	67%	5%	12%
Parking (#/hr)								0			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6 13	
Permitted Phases	4			8								
Actuated Green, G (s)		11.0			11.0			62.0			69.0	
Effective Green, g (s)		11.0			11.0			62.0			69.0	
Actuated g/C Ratio		0.12			0.12			0.69			0.77	
Clearance Time (s)		5.0			5.0			3.0			3.0	
Vehicle Extension (s)		8.0			8.0			3.0			3.0	
Lane Grp Cap (vph)		184			184			1027			1131	
v/s Ratio Prot					0.01			c0.26			c0.28	
v/s Ratio Perm		c0.02										
v/c Ratio		0.17			0.09			0.37			0.37	
Uniform Delay, d1		35.4			35.1			5.9			3.4	
Progression Factor		1.00			1.00			0.58			0.09	
Incremental Delay, d2		1.9			0.9			1.0			0.2	
Delay (s)		37.3			36.0			4.4			0.5	
Level of Service		D			D			A			A	
Approach Delay (s)		37.3			36.0			4.4			0.5	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	4.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1132: Ashland Ave. □ W 43rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	190	86	48	320	182	0	259	20	0	389	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	12	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.98		1.00	1.00	0.97		1.00	0.97		1.00	0.95
Flpb, ped/bikes	1.00	1.00		0.98	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1590	1515		1510	1600	1252		1259	1023		1221	979
Flt Permitted	0.41	1.00		0.47	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	690	1515		746	1600	1252		1259	1023		1221	979
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	80	200	91	51	337	192	0	273	21	0	409	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	80	291	0	51	337	192	0	273	21	0	409	67
Confl. Peds. (#/hr)	4		15	15		4			4			12
Confl. Bikes (#/hr)			2						2			2
Heavy Vehicles (%)	0%	5%	2%	4%	5%	11%	3%	5%	5%	22%	4%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								28	28		34	34
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8			2			6
Actuated Green, G (s)	32.0	32.0		32.0	32.0	32.0		49.0	49.0		49.0	49.0
Effective Green, g (s)	32.0	32.0		32.0	32.0	32.0		49.0	49.0		49.0	49.0
Actuated g/C Ratio	0.36	0.36		0.36	0.36	0.36		0.54	0.54		0.54	0.54
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	245	538		265	568	445		685	556		664	533
v/s Ratio Prot		0.19			c0.21			0.22			c0.33	
v/s Ratio Perm	0.12			0.07		0.15			0.02			0.07
v/c Ratio	0.33	0.54		0.19	0.59	0.43		0.40	0.04		0.62	0.13
Uniform Delay, d1	21.1	23.1		20.1	23.7	22.1		11.9	9.5		14.1	10.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		0.85	0.98		0.63	0.44
Incremental Delay, d2	3.5	3.9		1.6	4.5	3.0		1.7	0.1		4.1	0.5
Delay (s)	24.7	27.0		21.7	28.2	25.1		11.8	9.5		12.9	4.9
Level of Service	C	C		C	C	C		B	A		B	A
Approach Delay (s)		26.5			26.6			11.6			11.8	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1133: Ashland Ave. □ W 44th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	12	7	22	28	34	20	0	283	24	0	411	37
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.98			0.99			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.93			0.97			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1601			1621			1340			1133	
Flt Permitted		0.92			0.87			1.00			1.00	
Satd. Flow (perm)		1491			1435			1340			1133	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	7	23	29	36	21	0	298	25	0	433	39
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	43	0	0	86	0	0	323	0	0	472	0
Confl. Peds. (#/hr)	7		3	3		7			11			23
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	7%	0%	6%	14%	5%	4%	10%	4%	5%
Parking (#/hr)								16			42	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		9.8			9.8			71.2			71.2	
Effective Green, g (s)		9.8			9.8			71.2			71.2	
Actuated g/C Ratio		0.11			0.11			0.79			0.79	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Vehicle Extension (s)		5.0			5.0			3.0			3.0	
Lane Grp Cap (vph)		162			156			1060			896	
v/s Ratio Prot								0.24			c0.42	
v/s Ratio Perm		0.03			c0.06							
v/c Ratio		0.27			0.55			0.30			0.53	
Uniform Delay, d1		36.8			38.0			2.6			3.4	
Progression Factor		1.00			1.00			0.58			0.83	
Incremental Delay, d2		1.8			7.0			0.7			1.8	
Delay (s)		38.6			45.0			2.2			4.7	
Level of Service		D			D			A			A	
Approach Delay (s)		38.6			45.0			2.2			4.7	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1134: Ashland Ave. □ W 45th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	28	30	9	18	8	36	0	265	19	0	413	34
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.98			1.00			1.00	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.98			0.92			0.99			0.99	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1711			1586			1148			1167	
Flt Permitted		0.88			0.92			1.00			1.00	
Satd. Flow (perm)		1539			1483			1148			1167	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	29	32	9	19	8	38	0	279	20	0	435	36
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	70	0	0	65	0	0	299	0	0	471	0
Confl. Peds. (#/hr)	11		9	9			11		12			6
Confl. Bikes (#/hr)							1		2			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	10%	5%	0%	0%	3%	3%
Parking (#/hr)								40			40	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		23.0			23.0			58.0			58.0	
Effective Green, g (s)		23.0			23.0			58.0			58.0	
Actuated g/C Ratio		0.26			0.26			0.64			0.64	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		393			378			739			752	
v/s Ratio Prot								0.26			c0.40	
v/s Ratio Perm		c0.05			0.04							
v/c Ratio		0.18			0.17			0.40			0.63	
Uniform Delay, d1		26.1			26.1			7.7			9.5	
Progression Factor		1.00			1.00			0.76			0.48	
Incremental Delay, d2		1.0			1.0			1.6			3.5	
Delay (s)		27.1			27.1			7.4			8.0	
Level of Service		C			C			A			A	
Approach Delay (s)		27.1			27.1			7.4			8.0	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1135: Ashland Ave. □ W 46th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	36	78	49	12	33	51	0	234	45	0	379	50
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.95			0.97			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.96			0.93			0.98			0.98	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1648			1552			1129			1087	
Flt Permitted		0.92			0.96			1.00			1.00	
Satd. Flow (perm)		1533			1498			1129			1087	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	38	82	52	13	35	54	0	246	47	0	399	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	172	0	0	102	0	0	293	0	0	452	0
Confl. Peds. (#/hr)	37		9	9		37			39			14
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	3%	0%	0%	2%	0%	5%	0%	2%	3%	4%
Parking (#/hr)								38			48	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		21.0			21.0			61.0			61.0	
Effective Green, g (s)		21.0			21.0			61.0			61.0	
Actuated g/C Ratio		0.23			0.23			0.68			0.68	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		357			349			765			736	
v/s Ratio Prot								0.26			c0.42	
v/s Ratio Perm		c0.11			0.07							
v/c Ratio		0.48			0.29			0.38			0.61	
Uniform Delay, d1		29.8			28.4			6.3			8.0	
Progression Factor		1.00			1.00			0.66			0.20	
Incremental Delay, d2		4.6			2.1			1.3			3.1	
Delay (s)		34.4			30.5			5.5			4.7	
Level of Service		C			C			A			A	
Approach Delay (s)		34.4			30.5			5.5			4.7	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 1136: Ashland Ave. □ W 47th St. □ S. McDowell Ave.

8/8/2013



Movement	EBL2	EBT	EBR	WBL	WBT	WBR	WBR2	NBT	NBR	NBR2	SBT	SBR
Lane Configurations												
Volume (vph)	72	279	28	138	405	91	6	230	0	64	325	55
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	10	11	11	11	11	11
Total Lost time (s)	3.0	5.0		3.0	5.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	0.99		1.00	0.97			1.00	0.88		1.00	0.95
Flpb, ped/bikes	1.00	1.00		0.97	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.97			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1478	2856		1540	2778			1041	1272		1506	1191
Flt Permitted	0.40	1.00		0.50	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	627	2856		802	2778			1041	1272		1506	1191
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	76	294	29	145	426	96	6	242	0	67	342	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	76	323	0	145	528	0	0	242	67	0	342	58
Confl. Peds. (#/hr)			53	53		74				75		25
Confl. Bikes (#/hr)						4				2		
Heavy Vehicles (%)	8%	9%	11%	1%	9%	6%	0%	7%	0%	2%	4%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								52			0	0
Turn Type	pm+pt	NA		pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	34.4	29.6		38.8	31.8			41.4	41.4		41.4	41.4
Effective Green, g (s)	34.4	29.6		38.8	31.8			41.4	41.4		41.4	41.4
Actuated g/C Ratio	0.38	0.33		0.43	0.35			0.46	0.46		0.46	0.46
Clearance Time (s)	3.0	5.0		3.0	5.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	285	939		403	981			478	585		692	547
v/s Ratio Prot	0.01	0.11		c0.03	c0.19			c0.23			0.23	
v/s Ratio Perm	0.09			0.13					0.05			0.05
v/c Ratio	0.27	0.34		0.36	0.54			0.51	0.11		0.49	0.11
Uniform Delay, d1	18.2	22.9		16.2	23.2			17.1	13.9		17.0	13.8
Progression Factor	1.00	1.00		1.00	1.00			0.53	0.61		0.64	0.61
Incremental Delay, d2	0.5	1.0		0.6	2.1			3.5	0.4		2.0	0.3
Delay (s)	18.7	23.9		16.7	25.4			12.6	8.9		12.9	8.7
Level of Service	B	C		B	C			B	A		B	A
Approach Delay (s)		22.9			23.5			11.8			12.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SWR2
Lane Configurations	7
Volume (vph)	25
Ideal Flow (vphpl)	1800
Lane Width	12
Total Lost time (s)	5.0
Lane Util. Factor	1.00
Frbp, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	1557
Flt Permitted	1.00
Satd. Flow (perm)	1557
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	26
RTOR Reduction (vph)	0
Lane Group Flow (vph)	26
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Bus Blockages (#/hr)	0
Parking (#/hr)	
Turn Type	custom
Protected Phases	
Permitted Phases	8
Actuated Green, G (s)	31.8
Effective Green, g (s)	31.8
Actuated g/C Ratio	0.35
Clearance Time (s)	5.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	550
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.05
Uniform Delay, d1	19.1
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	19.3
Level of Service	B
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

1137: Ashland Ave. □ W 48th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↑			↗	
Volume (vph)	0	0	0	22	44	18	0	322	0	0	617	59
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)					5.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frbp, ped/bikes					0.99			1.00			0.99	
Flpb, ped/bikes					0.99			1.00			1.00	
Frt					0.97			1.00			0.99	
Flt Protected					0.99			1.00			1.00	
Satd. Flow (prot)					1642			1205			1073	
Flt Permitted					0.99			1.00			1.00	
Satd. Flow (perm)					1642			1205			1073	
Peak-hour factor, PHF	0.91	0.91	0.95	0.95	0.95	0.95	0.91	0.95	0.95	0.91	0.95	0.95
Adj. Flow (vph)	0	0	0	23	46	19	0	339	0	0	649	62
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	88	0	0	339	0	0	711	0
Confl. Peds. (#/hr)			20	20		21			10			27
Heavy Vehicles (%)	0%	0%	0%	0%	5%	0%	9%	4%	0%	0%	3%	5%
Parking (#/hr)								36			50	
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					23.0			58.0			58.0	
Effective Green, g (s)					23.0			58.0			58.0	
Actuated g/C Ratio					0.26			0.64			0.64	
Clearance Time (s)					5.0			4.0			4.0	
Lane Grp Cap (vph)					419			776			691	
v/s Ratio Prot								0.28			c0.66	
v/s Ratio Perm					0.05							
v/c Ratio					0.21			0.44			1.03	
Uniform Delay, d1					26.4			7.9			16.0	
Progression Factor					1.00			1.08			0.76	
Incremental Delay, d2					1.1			1.7			41.2	
Delay (s)					27.5			10.2			53.4	
Level of Service					C			B			D	
Approach Delay (s)		0.0			27.5			10.2			53.4	
Approach LOS		A			C			B			D	

Intersection Summary

HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1138: Ashland Ave. □ W 49th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	44	74	24	12	29	24	0	232	34	0	411	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frb, ped/bikes		1.00			0.98			0.99			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.98			0.95			0.98			0.99	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1706			1641			1108			1086	
Flt Permitted		0.89			0.94			1.00			1.00	
Satd. Flow (perm)		1549			1562			1108			1086	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	46	78	25	13	31	25	0	244	36	0	433	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	149	0	0	69	0	0	280	0	0	457	0
Confl. Peds. (#/hr)	17						17			18		26
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	0%	0%	4%	0%	0%	4%	0%	4%	3%	0%	3%	0%
Parking (#/hr)								44			50	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			57.0			57.0	
Effective Green, g (s)		24.0			24.0			57.0			57.0	
Actuated g/C Ratio		0.27			0.27			0.63			0.63	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		413			416			701			687	
v/s Ratio Prot								0.25			c0.42	
v/s Ratio Perm		c0.10			0.04							
v/c Ratio		0.36			0.17			0.40			0.67	
Uniform Delay, d1		26.8			25.3			8.1			10.5	
Progression Factor		1.00			1.00			0.76			0.10	
Incremental Delay, d2		2.4			0.9			1.6			0.5	
Delay (s)		29.2			26.2			7.8			1.5	
Level of Service		C			C			A			A	
Approach Delay (s)		29.2			26.2			7.8			1.5	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1139: Ashland Ave. □ W 50th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (vph)	20	18	16	14	10	37	0	240	20	0	401	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.97			0.97			0.99			0.99	
Flpb, ped/bikes		0.99			0.98			1.00			1.00	
Frt		0.96			0.92			0.99			0.99	
Flt Protected		0.98			0.99			1.00			1.00	
Satd. Flow (prot)		1633			1565			1112			1473	
Flt Permitted		0.91			0.94			1.00			1.00	
Satd. Flow (perm)		1505			1496			1112			1473	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	21	19	17	15	11	39	0	253	21	0	422	43
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	57	0	0	65	0	0	274	0	0	465	0
Confl. Peds. (#/hr)	13		40	40		13			25			42
Confl. Bikes (#/hr)			1						2			2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	4%	0%
Parking (#/hr)								44			0	
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		25.0			25.0			56.0			56.0	
Effective Green, g (s)		25.0			25.0			56.0			56.0	
Actuated g/C Ratio		0.28			0.28			0.62			0.62	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		418			415			691			916	
v/s Ratio Prot								0.25			c0.32	
v/s Ratio Perm		0.04			c0.04							
v/c Ratio		0.14			0.16			0.40			0.51	
Uniform Delay, d1		24.4			24.5			8.5			9.4	
Progression Factor		1.00			1.00			1.73			0.36	
Incremental Delay, d2		0.7			0.8			1.6			1.6	
Delay (s)		25.1			25.3			16.3			4.9	
Level of Service		C			C			B			A	
Approach Delay (s)		25.1			25.3			16.3			4.9	
Approach LOS		C			C			B			A	

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1140: Ashland Ave. □ W 51st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	219	46	54	298	44	0	244	19	0	347	54
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.92	1.00	1.00	0.90		1.00	0.92		1.00	0.94
Flpb, ped/bikes	0.96	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1473	1631	1314	1476	1541	1259		1143	888		1088	879
Flt Permitted	0.43	1.00	1.00	0.54	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	670	1631	1314	842	1541	1259		1143	888		1088	879
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	231	48	57	314	46	0	257	20	0	365	57
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	97	231	48	57	314	46	0	257	20	0	365	57
Confl. Peds. (#/hr)	29		21	21		29			20			13
Confl. Bikes (#/hr)			2			1						1
Heavy Vehicles (%)	4%	3%	0%	4%	9%	2%	3%	5%	5%	8%	4%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								42	42		50	50
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	31.0	31.0	31.0	31.0	31.0	31.0		50.0	50.0		50.0	50.0
Effective Green, g (s)	31.0	31.0	31.0	31.0	31.0	31.0		50.0	50.0		50.0	50.0
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34		0.56	0.56		0.56	0.56
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	230	561	452	290	530	433		635	493		604	488
v/s Ratio Prot		0.14			c0.20			0.22			c0.34	
v/s Ratio Perm	0.14		0.04	0.07		0.04			0.02			0.06
v/c Ratio	0.42	0.41	0.11	0.20	0.59	0.11		0.40	0.04		0.60	0.12
Uniform Delay, d1	22.6	22.5	20.1	20.7	24.3	20.1		11.5	9.1		13.4	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.33	0.41		0.35	0.44
Incremental Delay, d2	5.6	2.2	0.5	1.5	4.8	0.5		1.8	0.1		4.0	0.4
Delay (s)	28.2	24.8	20.5	22.3	29.1	20.6		5.6	3.9		8.6	4.6
Level of Service	C	C	C	C	C	C		A	A		A	A
Approach Delay (s)		25.1			27.2			5.5			8.1	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1142: Ashland Ave. □ W 53rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↑			↕	
Volume (vph)	0	0	0	16	10	13	0	282	3	0	421	19
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	11	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)					5.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frbp, ped/bikes					0.99			1.00			1.00	
Flpb, ped/bikes					0.97			1.00			1.00	
Frt					0.95			1.00			0.99	
Flt Protected					0.98			1.00			1.00	
Satd. Flow (prot)					1607			1202			1106	
Flt Permitted					0.98			1.00			1.00	
Satd. Flow (perm)					1607			1202			1106	
Peak-hour factor, PHF	0.92	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.95	0.92	0.95	0.95
Adj. Flow (vph)	0	0	0	17	11	14	0	297	3	0	443	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	42	0	0	300	0	0	463	0
Confl. Peds. (#/hr)			41	41		12			30			4
Confl. Bikes (#/hr)			4						3			1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	20%	3%	5%
Parking (#/hr)								36			48	
Turn Type				Perm	NA			NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8								
Actuated Green, G (s)					23.0			58.0			58.0	
Effective Green, g (s)					23.0			58.0			58.0	
Actuated g/C Ratio					0.26			0.64			0.64	
Clearance Time (s)					5.0			4.0			4.0	
Lane Grp Cap (vph)					410			774			712	
v/s Ratio Prot								0.25			c0.42	
v/s Ratio Perm					0.03							
v/c Ratio					0.10			0.39			0.65	
Uniform Delay, d1					25.6			7.6			9.8	
Progression Factor					1.00			0.58			1.03	
Incremental Delay, d2					0.5			1.4			4.0	
Delay (s)					26.1			5.8			14.1	
Level of Service					C			A			B	
Approach Delay (s)		0.0			26.1			5.8			14.1	
Approach LOS		A			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			11.6					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		9.0		
Intersection Capacity Utilization			51.3%					ICU Level of Service		A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1144: Ashland Ave. □ W Garfield Blvd. (WB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↙	↕	↗		↕			↕	↗
Volume (vph)	0	0	0	156	864	63	0	253	0	0	340	88
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	9	10	10	11	11	11	11	11	11
Total Lost time (s)				5.0	5.0	5.0		3.0			3.0	3.0
Lane Util. Factor				1.00	0.95	1.00		1.00			1.00	1.00
Frbp, ped/bikes				1.00	1.00	0.92		1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00		1.00			1.00	1.00
Frt				1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (prot)				1494	3129	1288		1464			1188	1006
Flt Permitted				0.95	1.00	1.00		1.00			1.00	1.00
Satd. Flow (perm)				1494	3129	1288		1464			1188	1006
Peak-hour factor, PHF	0.91	0.91	0.95	0.95	0.95	0.95	0.91	0.95	0.95	0.91	0.95	0.95
Adj. Flow (vph)	0	0	0	164	909	66	0	266	0	0	358	93
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	164	909	66	0	266	0	0	358	93
Confl. Peds. (#/hr)						41			29			19
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	0%	0%	3%	2%	2%	4%	7%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	3
Parking (#/hr)								0			38	38
Turn Type				Perm	NA	Perm		NA			NA	Perm
Protected Phases					8			2 5			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				31.0	31.0	31.0		36.0			42.0	42.0
Effective Green, g (s)				31.0	31.0	31.0		36.0			42.0	42.0
Actuated g/C Ratio				0.34	0.34	0.34		0.40			0.47	0.47
Clearance Time (s)				5.0	5.0	5.0					3.0	3.0
Lane Grp Cap (vph)				514	1077	443		585			554	469
v/s Ratio Prot					c0.29			c0.18			c0.30	
v/s Ratio Perm				0.11		0.05						0.09
v/c Ratio				0.32	0.84	0.15		0.45			0.65	0.20
Uniform Delay, d1				21.7	27.3	20.4		19.8			18.3	14.1
Progression Factor				1.00	1.00	1.00		0.53			0.65	0.61
Incremental Delay, d2				1.6	8.1	0.7		2.2			4.8	0.8
Delay (s)				23.4	35.4	21.1		12.8			16.7	9.4
Level of Service				C	D	C		B			B	A
Approach Delay (s)		0.0			32.8			12.8			15.2	
Approach LOS		A			C			B			B	

Intersection Summary

HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 1145: Ashland Ave. □ W Garfield Blvd. (EB)

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗					↑	↗		↑	
Volume (vph)	69	709	115	0	0	0	0	256	124	0	468	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0					3.0	3.0		5.0	
Lane Util. Factor	1.00	0.95	1.00					1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00	0.93					1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00					1.00	1.00		1.00	
Frt	1.00	1.00	0.85					1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)	1494	3099	1283					1259	1102		1506	
Flt Permitted	0.95	1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)	1494	3099	1283					1259	1102		1506	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.95	0.94	0.95	0.95	0.94	0.95	0.95
Adj. Flow (vph)	73	746	121	0	0	0	0	269	131	0	493	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	73	746	121	0	0	0	0	269	131	0	493	0
Confl. Peds. (#/hr)			31						8			23
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	3%	3%	4%	0%	0%	0%	0%	5%	0%	4%	4%	0%
Parking (#/hr)								28	28		0	
Turn Type	Perm	NA	Perm					NA	Perm		NA	
Protected Phases		4						2			1	6
Permitted Phases	4		4						2			
Actuated Green, G (s)	31.0	31.0	31.0					32.0	32.0		49.0	
Effective Green, g (s)	31.0	31.0	31.0					32.0	32.0		49.0	
Actuated g/C Ratio	0.34	0.34	0.34					0.36	0.36		0.54	
Clearance Time (s)	5.0	5.0	5.0					3.0	3.0			
Lane Grp Cap (vph)	514	1067	441					447	391		819	
v/s Ratio Prot		c0.24						0.21			c0.33	
v/s Ratio Perm	0.05		0.09						0.12			
v/c Ratio	0.14	0.70	0.27					0.60	0.34		0.60	
Uniform Delay, d1	20.3	25.5	21.4					23.8	21.2		13.9	
Progression Factor	1.00	1.00	1.00					0.69	0.70		0.78	
Incremental Delay, d2	0.6	3.8	1.5					5.5	2.1		2.8	
Delay (s)	20.9	29.3	22.9					21.9	17.0		13.6	
Level of Service	C	C	C					C	B		B	
Approach Delay (s)		27.8			0.0			20.3			13.6	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			22.3					HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		13.0		
Intersection Capacity Utilization			105.0%					ICU Level of Service		G		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

1148: Ashland Ave. □ W 57th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	16	18	47	0	0	0	0	328	15	0	447	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.97						1.00			1.00	
Flpb, ped/bikes		0.98						1.00			1.00	
Frt		0.92						0.99			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1569						1172			1104	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1569						1172			1104	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	19	49	0	0	0	0	345	16	0	471	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	85	0	0	0	0	0	361	0	0	471	0
Confl. Peds. (#/hr)	42		16				42		22			29
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	4%	0%
Parking (#/hr)								40			48	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						58.0			58.0	
Effective Green, g (s)		23.0						58.0			58.0	
Actuated g/C Ratio		0.26						0.64			0.64	
Clearance Time (s)		5.0						4.0			4.0	
Lane Grp Cap (vph)		400						755			711	
v/s Ratio Prot								0.31			c0.43	
v/s Ratio Perm		0.05										
v/c Ratio		0.21						0.48			0.66	
Uniform Delay, d1		26.4						8.2			9.9	
Progression Factor		1.00						0.91			0.64	
Incremental Delay, d2		1.2						2.0			4.1	
Delay (s)		27.6						9.5			10.5	
Level of Service		C						A			B	
Approach Delay (s)		27.6			0.0			9.5			10.5	
Approach LOS		C			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			11.7					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		9.0		
Intersection Capacity Utilization			51.5%					ICU Level of Service		A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1150: Ashland Ave. □ W 59th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	242	62	111	404	36	0	292	40	0	516	35
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.65	1.00	1.00	0.97		1.00	1.00		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	0.91	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1594	1556	883	1457	1600	1340		1288	1125		1506	1220
Flt Permitted	0.33	1.00	1.00	0.48	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	553	1556	883	743	1600	1340		1288	1125		1506	1220
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	84	255	65	117	425	38	0	307	42	0	543	37
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	84	255	65	117	425	38	0	307	42	0	543	37
Confl. Peds. (#/hr)	5		120	120		5						19
Heavy Vehicles (%)	0%	8%	5%	0%	5%	3%	2%	4%	0%	7%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								26	26		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	35.0	31.0	31.0	38.2	32.6	32.6		41.4	41.4		41.4	41.4
Effective Green, g (s)	35.0	31.0	31.0	38.2	32.6	32.6		41.4	41.4		41.4	41.4
Actuated g/C Ratio	0.39	0.34	0.34	0.42	0.36	0.36		0.46	0.46		0.46	0.46
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	261	535	304	359	579	485		592	517		692	561
v/s Ratio Prot	0.01	0.16		c0.02	c0.27			0.24			c0.36	
v/s Ratio Perm	0.11		0.07	0.12		0.03			0.04			0.03
v/c Ratio	0.32	0.48	0.21	0.33	0.73	0.08		0.52	0.08		0.78	0.07
Uniform Delay, d1	18.5	23.1	20.9	16.5	24.9	18.8		17.2	13.6		20.5	13.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.96	0.86		0.86	1.16
Incremental Delay, d2	0.7	3.0	1.6	0.5	8.0	0.3		3.0	0.3		7.5	0.2
Delay (s)	19.2	26.2	22.5	17.0	33.0	19.2		19.6	12.0		25.2	15.9
Level of Service	B	C	C	B	C	B		B	B		C	B
Approach Delay (s)		24.1			28.8			18.7			24.6	
Approach LOS		C			C			B			C	

Intersection Summary

HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1152: Ashland Ave. □ W 61st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	31	24	50	0	0	0	0	309	28	0	553	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	16	16	16	16	16	16	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.98						0.99			1.00	
Flpb, ped/bikes		0.99						1.00			1.00	
Frt		0.94						0.99			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1808						1235			1064	
Flt Permitted		0.99						1.00			1.00	
Satd. Flow (perm)		1808						1235			1064	
Peak-hour factor, PHF	0.95	0.95	0.95	0.99	0.99	0.95	0.99	0.95	0.95	0.99	0.95	0.95
Adj. Flow (vph)	33	25	53	0	0	0	0	325	29	0	582	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	111	0	0	0	0	0	354	0	0	582	0
Confl. Peds. (#/hr)	10		16				10			38		28
Confl. Bikes (#/hr)										1		3
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	2%	0%	14%	3%	0%
Parking (#/hr)								32			54	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						58.0			58.0	
Effective Green, g (s)		23.0						58.0			58.0	
Actuated g/C Ratio		0.26						0.64			0.64	
Clearance Time (s)		5.0						4.0			4.0	
Lane Grp Cap (vph)		462						795			685	
v/s Ratio Prot								0.29			c0.55	
v/s Ratio Perm		0.06										
v/c Ratio		0.24						0.45			0.85	
Uniform Delay, d1		26.6						8.0			12.6	
Progression Factor		1.00						1.00			0.54	
Incremental Delay, d2		1.2						1.8			9.8	
Delay (s)		27.8						9.8			16.7	
Level of Service		C						A			B	
Approach Delay (s)		27.8			0.0			9.8			16.7	
Approach LOS		C			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			15.5					HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			90.0					Sum of lost time (s)		9.0		
Intersection Capacity Utilization			57.4%					ICU Level of Service		B		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Signalized Intersection Capacity Analysis

1154: Ashland Ave. □ W 63rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	400	90	112	481	48	0	317	44	0	615	78
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	10	10	10	10	12	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0			2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.87	1.00	0.99			1.00	0.62		1.00	0.64
Flpb, ped/bikes	0.96	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1503	1615	1236	1517	1591			1673	782		1673	924
Flt Permitted	0.25	1.00	1.00	0.38	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	391	1615	1236	601	1591			1673	782		1673	924
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.92	0.95	0.95
Adj. Flow (vph)	58	421	95	118	506	51	0	334	46	0	647	82
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	58	421	95	118	557	0	0	334	46	0	647	82
Confl. Peds. (#/hr)	86		72	72		86			129			122
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	9%	4%	1%	0%	3%	0%	5%	4%	5%	2%	4%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	0
Parking (#/hr)									0			
Turn Type	Perm	NA	Perm	Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	39.0	39.0	39.0	39.0	39.0			44.0	44.0		44.0	44.0
Effective Green, g (s)	39.0	39.0	39.0	39.0	39.0			44.0	44.0		44.0	44.0
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43			0.49	0.49		0.49	0.49
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	169	699	535	260	689			817	382		817	451
v/s Ratio Prot		0.26			c0.35			0.20			c0.39	
v/s Ratio Perm	0.15		0.08	0.20					0.06			0.09
v/c Ratio	0.34	0.60	0.18	0.45	0.81			0.41	0.12		0.79	0.18
Uniform Delay, d1	17.0	19.6	15.7	18.0	22.2			14.7	12.5		19.2	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.73	0.88		0.62	0.52
Incremental Delay, d2	5.5	3.8	0.7	5.6	9.9			1.5	0.6		6.0	0.7
Delay (s)	22.4	23.4	16.4	23.6	32.1			12.2	11.6		17.9	7.4
Level of Service	C	C	B	C	C			B	B		B	A
Approach Delay (s)		22.1			30.6			12.2			16.7	
Approach LOS		C			C			B			B	

Intersection Summary		
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.79	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 7.0
Intersection Capacity Utilization	79.5%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1156: Ashland Ave. □ W 65th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕			↑			↗		
Volume (vph)	0	0	0	12	22	27	0	352	0	0	494	24	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	16	16	16	11	11	11	11	11	11	
Total Lost time (s)					5.0			4.0			4.0		
Lane Util. Factor					1.00			1.00			1.00		
Frbp, ped/bikes					0.98			1.00			0.99		
Flpb, ped/bikes					0.99			1.00			1.00		
Frt					0.94			1.00			0.99		
Flt Protected					0.99			1.00			1.00		
Satd. Flow (prot)					1847			1436			1201		
Flt Permitted					0.99			1.00			1.00		
Satd. Flow (perm)					1847			1436			1201		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	0	0	0	13	23	28	0	371	0	0	520	25	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	64	0	0	371	0	0	545	0	
Confl. Peds. (#/hr)			6	6		5			41			42	
Confl. Bikes (#/hr)			1									3	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	3%	0%	
Parking (#/hr)								10			36		
Turn Type				Perm	NA			NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8									
Actuated Green, G (s)					7.8			73.2			73.2		
Effective Green, g (s)					7.8			73.2			73.2		
Actuated g/C Ratio					0.09			0.81			0.81		
Clearance Time (s)					5.0			4.0			4.0		
Vehicle Extension (s)					5.0			3.0			3.0		
Lane Grp Cap (vph)					160			1167			976		
v/s Ratio Prot								0.26			c0.45		
v/s Ratio Perm					0.03								
v/c Ratio					0.40			0.32			0.56		
Uniform Delay, d1					38.9			2.1			2.9		
Progression Factor					1.00			0.54			0.90		
Incremental Delay, d2					3.4			0.6			1.7		
Delay (s)					42.3			1.7			4.3		
Level of Service					D			A			A		
Approach Delay (s)		0.0			42.3			1.7			4.3		
Approach LOS		A			D			A			A		
Intersection Summary													
HCM 2000 Control Delay			5.8		HCM 2000 Level of Service						A		
HCM 2000 Volume to Capacity ratio			0.54										
Actuated Cycle Length (s)			90.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			40.5%		ICU Level of Service						A		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1158: Ashland Ave. □ W Marquette Rd.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	340	92	112	387	30	0	345	30	0	462	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	10	9	10	10	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0			5.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	
Frbp, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95		0.99			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99			0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00	
Satd. Flow (prot)	1531	1647	1300	1531	1680	1351		1180			1129	
Flt Permitted	0.35	1.00	1.00	0.35	1.00	1.00		1.00			1.00	
Satd. Flow (perm)	567	1647	1300	557	1680	1351		1180			1129	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.98	0.95	0.95	0.98	0.95	0.95
Adj. Flow (vph)	51	358	97	118	407	32	0	363	32	0	486	34
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	51	358	97	118	407	32	0	395	0	0	520	0
Confl. Peds. (#/hr)	21		22	22		21			32			32
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	0%	2%	4%	0%	0%	0%	0%	3%	0%	10%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								38	38		44	44
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8						
Actuated Green, G (s)	33.2	30.2	30.2	37.2	32.2	32.2		41.8			41.8	
Effective Green, g (s)	33.2	30.2	30.2	37.2	32.2	32.2		41.8			41.8	
Actuated g/C Ratio	0.37	0.34	0.34	0.41	0.36	0.36		0.46			0.46	
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0			5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	241	552	436	284	601	483		548			524	
v/s Ratio Prot	0.01	0.22		c0.02	c0.24			0.33			c0.46	
v/s Ratio Perm	0.07		0.07	0.15		0.02						
v/c Ratio	0.21	0.65	0.22	0.42	0.68	0.07		0.72			0.99	
Uniform Delay, d1	19.1	25.4	21.5	17.7	24.5	19.0		19.4			23.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.97			0.63	
Incremental Delay, d2	0.4	5.8	1.2	1.0	6.0	0.3		7.5			34.9	
Delay (s)	19.6	31.2	22.6	18.7	30.5	19.3		26.3			49.9	
Level of Service	B	C	C	B	C	B		C			D	
Approach Delay (s)		28.4			27.4			26.3			49.9	
Approach LOS		C			C			C			D	

Intersection Summary		
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.85	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 13.0
Intersection Capacity Utilization	70.3%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

1160: Ashland Ave. □ W 69th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕	↕		↕	↕		↕	↕
Volume (vph)	42	291	52	64	292	34	0	278	58	0	492	71
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes		0.99			1.00	0.81		1.00	0.91		1.00	0.84
Flpb, ped/bikes		0.99			0.99	1.00		1.00	1.00		1.00	1.00
Frt		0.98			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			0.99	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)		3037			1642	1164		1149	1342		1037	1229
Flt Permitted		0.81			0.85	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)		2461			1414	1164		1149	1342		1037	1229
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	44	306	55	67	307	36	0	293	61	0	518	75
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	405	0	0	374	36	0	293	61	0	518	75
Confl. Peds. (#/hr)	91		48	48		91			52			54
Confl. Bikes (#/hr)						2						1
Heavy Vehicles (%)	0%	3%	10%	0%	5%	3%	6%	3%	0%	4%	4%	1%
Parking (#/hr)								44			56	
Turn Type	Perm	NA		Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8			2			6
Actuated Green, G (s)		29.0			29.0	29.0		52.0	52.0		52.0	52.0
Effective Green, g (s)		29.0			29.0	29.0		52.0	52.0		52.0	52.0
Actuated g/C Ratio		0.32			0.32	0.32		0.58	0.58		0.58	0.58
Clearance Time (s)		5.0			5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)		792			455	375		663	775		599	710
v/s Ratio Prot								0.26			c0.50	
v/s Ratio Perm		0.16			c0.26	0.03			0.05			0.06
v/c Ratio		0.51			0.82	0.10		0.44	0.08		0.86	0.11
Uniform Delay, d1		24.8			28.1	21.3		10.8	8.4		16.0	8.5
Progression Factor		1.00			1.00	1.00		1.21	1.08		0.65	0.54
Incremental Delay, d2		2.4			15.3	0.5		2.0	0.2		11.4	0.2
Delay (s)		27.1			43.5	21.8		15.0	9.3		21.8	4.8
Level of Service		C			D	C		B	A		C	A
Approach Delay (s)		27.1			41.6			14.0			19.6	
Approach LOS		C			D			B			B	

Intersection Summary

HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1162: Ashland Ave. □ W 71st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Volume (vph)	61	337	78	107	368	84	0	319	15	0	537	52		
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800		
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11		
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0			4.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00			
Frbp, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.92		1.00			0.99			
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00		1.00			1.00			
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99			0.99			
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00			1.00			
Satd. Flow (prot)	1537	1647	1324	1551	1663	1294		1424			1494			
Flt Permitted	0.31	1.00	1.00	0.36	1.00	1.00		1.00			1.00			
Satd. Flow (perm)	506	1647	1324	580	1663	1294		1424			1494			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95		
Adj. Flow (vph)	64	355	82	113	387	88	0	336	16	0	565	55		
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0		
Lane Group Flow (vph)	64	355	82	113	387	88	0	352	0	0	620	0		
Confl. Peds. (#/hr)	38		31	31		38			20			29		
Confl. Bikes (#/hr)									1					
Heavy Vehicles (%)	3%	2%	0%	2%	1%	1%	8%	3%	0%	7%	3%	0%		
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3		
Parking (#/hr)								10	10		0	0		
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA			NA			
Protected Phases	7	4		3	8			2			6			
Permitted Phases	4		4	8		8								
Actuated Green, G (s)	32.6	28.6	28.6	32.6	28.6	28.6		45.4			45.4			
Effective Green, g (s)	32.6	28.6	28.6	32.6	28.6	28.6		45.4			45.4			
Actuated g/C Ratio	0.36	0.32	0.32	0.36	0.32	0.32		0.50			0.50			
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	5.0		4.0			4.0			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0			
Lane Grp Cap (vph)	229	523	420	253	528	411		718			753			
v/s Ratio Prot	0.01	0.22		c0.02	c0.23			0.25			c0.42			
v/s Ratio Perm	0.09		0.06	0.14		0.07								
v/c Ratio	0.28	0.68	0.20	0.45	0.73	0.21		0.49			0.82			
Uniform Delay, d1	19.9	26.7	22.3	21.2	27.3	22.5		14.7			18.9			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			0.60			
Incremental Delay, d2	0.7	6.9	1.0	1.3	8.7	1.2		2.4			5.6			
Delay (s)	20.6	33.6	23.4	22.5	36.0	23.7		17.1			17.0			
Level of Service	C	C	C	C	D	C		B			B			
Approach Delay (s)		30.3			31.6			17.1			17.0			
Approach LOS		C			C			B			B			
Intersection Summary														
HCM 2000 Control Delay			24.4									HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio			0.77											
Actuated Cycle Length (s)			90.0								12.0			
Intersection Capacity Utilization			72.2%										ICU Level of Service	C
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

1168: Ashland Ave. □ W 74th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗		↑	↗		↑	↗
Volume (vph)	41	157	60	49	339	88	0	260	21	0	557	36
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	11	11	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes		1.00	0.91		1.00	0.96		1.00	0.94		1.00	0.88
Flpb, ped/bikes		1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00
Frt		1.00	0.85		1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99	1.00		0.99	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)		1617	1265		1603	1373		1520	1385		1520	1204
Flt Permitted		0.83	1.00		0.94	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)		1352	1265		1509	1373		1520	1385		1520	1204
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.95	0.95
Adj. Flow (vph)	43	165	63	52	357	93	0	274	22	0	586	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	208	63	0	409	93	0	274	22	0	586	38
Confl. Peds. (#/hr)	12		44	44		12			19			44
Heavy Vehicles (%)	0%	8%	3%	0%	4%	0%	9%	3%	0%	5%	3%	8%
Parking (#/hr)								0			0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)		28.0	28.0		28.0	28.0		38.0	38.0		38.0	38.0
Effective Green, g (s)		28.0	28.0		28.0	28.0		38.0	38.0		38.0	38.0
Actuated g/C Ratio		0.37	0.37		0.37	0.37		0.51	0.51		0.51	0.51
Clearance Time (s)		5.0	5.0		5.0	5.0		4.0	4.0		4.0	4.0
Lane Grp Cap (vph)		504	472		563	512		770	701		770	610
v/s Ratio Prot								0.18			c0.39	
v/s Ratio Perm		0.15	0.05		c0.27	0.07			0.02			0.03
v/c Ratio		0.41	0.13		0.73	0.18		0.36	0.03		0.76	0.06
Uniform Delay, d1		17.4	15.5		20.2	15.8		11.1	9.3		14.9	9.4
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.04		1.00	1.00
Incremental Delay, d2		2.5	0.6		8.0	0.8		1.2	0.1		7.0	0.2
Delay (s)		19.9	16.1		28.2	16.6		12.3	9.8		21.8	9.6
Level of Service		B	B		C	B		B	A		C	A
Approach Delay (s)		19.0			26.0			12.1			21.1	
Approach LOS		B			C			B			C	

Intersection Summary

HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1170: Ashland Ave. □ W 76th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕			↕	
Volume (vph)	64	290	37	88	313	82	0	210	35	0	505	32
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		3044			3014			1251			1177	
Flt Permitted		0.78			0.77			1.00			1.00	
Satd. Flow (perm)		2394			2342			1251			1177	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	67	305	39	93	329	86	0	221	37	0	532	34
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	411	0	0	508	0	0	258	0	0	566	0
Confl. Peds. (#/hr)	6		20	20		6			5			8
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	3%	2%	0%	0%	2%	1%	0%	4%	0%	7%	4%	3%
Parking (#/hr)								28				38
Turn Type	Perm	NA		Perm	NA			NA			NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.0			24.0			42.0			42.0	
Effective Green, g (s)		24.0			24.0			42.0			42.0	
Actuated g/C Ratio		0.32			0.32			0.56			0.56	
Clearance Time (s)		5.0			5.0			4.0			4.0	
Lane Grp Cap (vph)		766			749			700			659	
v/s Ratio Prot								0.21			c0.48	
v/s Ratio Perm		0.17			c0.22							
v/c Ratio		0.54			0.68			0.37			0.86	
Uniform Delay, d1		20.9			22.1			9.1			14.0	
Progression Factor		1.00			1.00			1.00			0.42	
Incremental Delay, d2		2.7			4.9			1.5			10.7	
Delay (s)		23.6			27.0			10.6			16.6	
Level of Service		C			C			B			B	
Approach Delay (s)		23.6			27.0			10.6			16.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1173: Ashland Ave. □ W 79th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	451	30	64	479	73	0	189	28	0	553	64
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	9	10	9	9	10	9	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.81	1.00	1.00	0.89		1.00	0.80		1.00	0.91
Flpb, ped/bikes	0.97	1.00	1.00	0.94	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1493	1585	1118	1447	1600	1210		1188	834		1166	900
Flt Permitted	0.19	1.00	1.00	0.22	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	295	1585	1118	338	1600	1210		1188	834		1166	900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	101	475	32	67	504	77	0	199	29	0	582	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	101	475	32	67	504	77	0	199	29	0	582	67
Confl. Peds. (#/hr)	54		99	99		54			68			27
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	6%	0%	0%	5%	1%	7%	4%	0%	10%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								38	38		42	42
Turn Type	Perm	NA	Perm	Perm	NA	Perm		NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	34.0	34.0	34.0	34.0	34.0	34.0		50.0	50.0		50.0	50.0
Effective Green, g (s)	34.0	34.0	34.0	34.0	34.0	34.0		50.0	50.0		50.0	50.0
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34		0.50	0.50		0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	100	538	380	114	544	411		594	417		583	450
v/s Ratio Prot		0.30			0.32			0.17			c0.50	
v/s Ratio Perm	c0.34		0.03	0.20		0.06			0.03			0.07
v/c Ratio	1.01	0.88	0.08	0.59	0.93	0.19		0.34	0.07		1.00	0.15
Uniform Delay, d1	33.0	31.1	22.4	27.2	31.8	23.3		15.0	13.0		25.0	13.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.51	1.54		1.00	1.00
Incremental Delay, d2	92.7	18.6	0.4	20.3	24.1	1.0		1.4	0.3		36.9	0.7
Delay (s)	125.7	49.8	22.9	47.5	55.9	24.3		24.1	20.2		61.8	14.2
Level of Service	F	D	C	D	E	C		C	C		E	B
Approach Delay (s)		61.0			51.3			23.6			56.9	
Approach LOS		E			D			C			E	

Intersection Summary

HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1175: Ashland Ave. □ W 81st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↖	↗		↑			↖	↗	
Volume (vph)	0	0	0	48	72	50	0	331	0	0	622	119	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	
Lane Width	12	12	12	10	10	10	11	11	11	11	11	11	
Total Lost time (s)					5.0	5.0		4.0			4.0		
Lane Util. Factor					1.00	1.00		1.00			1.00		
Frbp, ped/bikes					1.00	0.93		1.00			0.97		
Flpb, ped/bikes					0.97	1.00		1.00			1.00		
Frt					1.00	0.85		1.00			0.98		
Flt Protected					0.98	1.00		1.00			1.00		
Satd. Flow (prot)					1602	1297		1160			1007		
Flt Permitted					0.98	1.00		1.00			1.00		
Satd. Flow (perm)					1602	1297		1160			1007		
Peak-hour factor, PHF	0.94	0.94	0.95	0.95	0.95	0.95	0.94	0.95	0.95	0.94	0.95	0.95	
Adj. Flow (vph)	0	0	0	51	76	53	0	348	0	0	655	125	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	127	53	0	348	0	0	780	0	
Confl. Peds. (#/hr)			31	31		25			62			51	
Confl. Bikes (#/hr)												1	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	3%	2%	0%	0%	3%	2%	
Parking (#/hr)								44			54		
Turn Type				Perm	NA	Perm		NA			NA		
Protected Phases					8			2			6		
Permitted Phases				8		8							
Actuated Green, G (s)					23.0	23.0		68.0			68.0		
Effective Green, g (s)					23.0	23.0		68.0			68.0		
Actuated g/C Ratio					0.23	0.23		0.68			0.68		
Clearance Time (s)					5.0	5.0		4.0			4.0		
Lane Grp Cap (vph)					368	298		788			684		
v/s Ratio Prot								0.30			c0.77		
v/s Ratio Perm					0.08	0.04							
v/c Ratio					0.35	0.18		0.44			1.14		
Uniform Delay, d1					32.2	30.9		7.3			16.0		
Progression Factor					1.00	1.00		0.62			0.45		
Incremental Delay, d2					2.6	1.3		1.7			73.7		
Delay (s)					34.8	32.2		6.2			80.9		
Level of Service					C	C		A			F		
Approach Delay (s)		0.0			34.0			6.2			80.9		
Approach LOS		A			C			A			F		
Intersection Summary													
HCM 2000 Control Delay			54.6		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.94										
Actuated Cycle Length (s)			100.0		Sum of lost time (s)						9.0		
Intersection Capacity Utilization			69.5%		ICU Level of Service						C		
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1177: Ashland Ave. □ W 83rd St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	359	105	95	355	66	0	318	52	0	627	41
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.89	1.00	0.99			1.00	0.80		1.00	0.92
Flpb, ped/bikes	0.98	1.00	1.00	0.96	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1520	1631	1248	1534	3087			1327	904		1081	862
Flt Permitted	0.39	1.00	1.00	0.25	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	620	1631	1248	405	3087			1327	904		1081	862
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.99	0.95	0.95	0.99	0.95	0.95
Adj. Flow (vph)	79	378	111	100	374	69	0	335	55	0	660	43
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	79	378	111	100	443	0	0	335	55	0	660	43
Confl. Peds. (#/hr)	14		47	47		14			65			59
Heavy Vehicles (%)	3%	3%	2%	0%	0%	0%	2%	1%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								26	26		52	52
Turn Type	Perm	NA	Perm	Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	27.0	27.0	27.0	27.0	27.0			64.0	64.0		64.0	64.0
Effective Green, g (s)	27.0	27.0	27.0	27.0	27.0			64.0	64.0		64.0	64.0
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27			0.64	0.64		0.64	0.64
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0			4.0	4.0		4.0	4.0
Lane Grp Cap (vph)	167	440	336	109	833			849	578		691	551
v/s Ratio Prot		0.23			0.14			0.25			c0.61	
v/s Ratio Perm	0.13		0.09	c0.25					0.06			0.05
v/c Ratio	0.47	0.86	0.33	0.92	0.53			0.39	0.10		0.96	0.08
Uniform Delay, d1	30.5	34.7	29.3	35.4	31.1			8.7	6.9		16.7	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			0.75	0.73		0.47	0.68
Incremental Delay, d2	9.3	19.2	2.6	66.1	2.4			1.3	0.3		4.1	0.0
Delay (s)	39.9	53.8	31.9	101.5	33.5			7.8	5.4		12.0	4.6
Level of Service	D	D	C	F	C			A	A		B	A
Approach Delay (s)		47.6			46.0			7.5			11.5	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

1179: Ashland Ave. □ W 85th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (vph)	38	26	38	0	0	0	0	314	45	0	721	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)		5.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frbp, ped/bikes		0.98						0.99			1.00	
Flpb, ped/bikes		0.98						1.00			1.00	
Frt		0.95						0.98			1.00	
Flt Protected		0.98						1.00			1.00	
Satd. Flow (prot)		1616						1147			1149	
Flt Permitted		0.98						1.00			1.00	
Satd. Flow (perm)		1616						1147			1149	
Peak-hour factor, PHF	0.95	0.95	0.95	0.90	0.90	0.95	0.90	0.95	0.95	0.90	0.95	0.95
Adj. Flow (vph)	40	27	40	0	0	0	0	331	47	0	759	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	107	0	0	0	0	0	378	0	0	759	0
Confl. Peds. (#/hr)	11		5				11			19		16
Confl. Bikes (#/hr)										1		1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	3%	0%
Parking (#/hr)								42			44	
Turn Type	Perm	NA						NA			NA	
Protected Phases		4						2			6	
Permitted Phases	4											
Actuated Green, G (s)		10.0						81.0			81.0	
Effective Green, g (s)		10.0						81.0			81.0	
Actuated g/C Ratio		0.10						0.81			0.81	
Clearance Time (s)		5.0						4.0			4.0	
Vehicle Extension (s)		6.0						3.0			3.0	
Lane Grp Cap (vph)		161						929			930	
v/s Ratio Prot								0.33			c0.66	
v/s Ratio Perm		0.07										
v/c Ratio		0.66						0.41			0.82	
Uniform Delay, d1		43.4						2.7			5.3	
Progression Factor		1.00						0.99			0.63	
Incremental Delay, d2		15.1						1.2			4.1	
Delay (s)		58.5						3.9			7.5	
Level of Service		E						A			A	
Approach Delay (s)		58.5			0.0			3.9			7.5	
Approach LOS		E			A			A			A	

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1181: Ashland Ave. □ W 87th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘		↕	↗		↗	↘
Volume (vph)	94	838	174	126	1092	157	0	297	38	0	542	85
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	10	10	11	10	11	11	11	11	11	11
Total Lost time (s)	2.0	5.0	5.0	2.0	5.0	5.0		5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.87	1.00	1.00	0.90		1.00	0.90		1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)	1596	3179	1207	1562	3210	1253		1262	973		1092	883
Flt Permitted	0.12	1.00	1.00	0.13	1.00	1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)	207	3179	1207	214	3210	1253		1262	973		1092	883
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	99	882	183	133	1149	165	0	313	40	0	571	89
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	99	882	183	133	1149	165	0	313	40	0	571	89
Confl. Peds. (#/hr)	39		56	56		39			78			22
Heavy Vehicles (%)	0%	4%	3%	2%	3%	3%	3%	2%	0%	3%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								32	32		52	52
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm		NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	37.2	32.4	32.4	41.4	34.6	34.6		48.6	48.6		48.6	48.6
Effective Green, g (s)	37.2	32.4	32.4	41.4	34.6	34.6		48.6	48.6		48.6	48.6
Actuated g/C Ratio	0.37	0.32	0.32	0.41	0.35	0.35		0.49	0.49		0.49	0.49
Clearance Time (s)	2.0	5.0	5.0	2.0	5.0	5.0		5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	143	1029	391	182	1110	433		613	472		530	429
v/s Ratio Prot	0.03	0.28		c0.05	c0.36			0.25			c0.52	
v/s Ratio Perm	0.22		0.15	0.25		0.13			0.04			0.10
v/c Ratio	0.69	0.86	0.47	0.73	1.04	0.38		0.51	0.08		1.08	0.21
Uniform Delay, d1	24.7	31.6	26.9	21.6	32.7	24.6		17.6	13.8		25.7	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.86	0.91		0.80	0.69
Incremental Delay, d2	13.5	9.2	4.0	14.0	36.5	2.5		2.9	0.3		52.5	0.6
Delay (s)	38.3	40.8	30.9	35.6	69.2	27.2		18.0	12.8		73.1	10.8
Level of Service	D	D	C	D	E	C		B	B		E	B
Approach Delay (s)		39.0			61.3			17.4			64.7	
Approach LOS		D			E			B			E	

Intersection Summary

HCM 2000 Control Delay	50.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1185: Ashland Ave. □ W 91st St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑	↗		↑	↗
Volume (vph)	15	30	34	35	6	27	0	356	20	0	663	8
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	10	10	10	10	10	11	11	11	11	11	11
Total Lost time (s)		5.0			5.0			4.0	4.0		4.0	4.0
Lane Util. Factor		1.00			1.00			1.00	1.00		1.00	1.00
Frbp, ped/bikes		0.97			0.97			1.00	0.91		1.00	0.96
Flpb, ped/bikes		0.99			0.98			1.00	1.00		1.00	1.00
Frt		0.94			0.95			1.00	0.85		1.00	0.85
Flt Protected		0.99			0.97			1.00	1.00		1.00	1.00
Satd. Flow (prot)		1515			1486			1054	1349		1166	1416
Flt Permitted		0.93			0.79			1.00	1.00		1.00	1.00
Satd. Flow (perm)		1427			1206			1054	1349		1166	1416
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	32	36	37	6	28	0	375	21	0	698	8
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	84	0	0	71	0	0	375	21	0	698	8
Confl. Peds. (#/hr)	11		9	9		11			18			6
Confl. Bikes (#/hr)			2			1						
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	10%	4%	0%	11%	3%	0%
Parking (#/hr)								54			42	
Turn Type	Perm	NA		Perm	NA			NA	Perm		NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		12.0			12.0			79.0	79.0		79.0	79.0
Effective Green, g (s)		12.0			12.0			79.0	79.0		79.0	79.0
Actuated g/C Ratio		0.12			0.12			0.79	0.79		0.79	0.79
Clearance Time (s)		5.0			5.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)		8.0			8.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		171			144			832	1065		921	1118
v/s Ratio Prot								0.36			c0.60	
v/s Ratio Perm		0.06			c0.06				0.02			0.01
v/c Ratio		0.49			0.49			0.45	0.02		0.76	0.01
Uniform Delay, d1		41.1			41.2			3.4	2.2		5.5	2.2
Progression Factor		1.00			1.00			1.00	1.00		0.59	0.70
Incremental Delay, d2		9.2			10.9			1.8	0.0		3.5	0.0
Delay (s)		50.3			52.1			5.2	2.3		6.8	1.6
Level of Service		D			D			A	A		A	A
Approach Delay (s)		50.3			52.1			5.0			6.7	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1191: Ashland Ave. □ W 95th St.

8/8/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑			↑	↗		↑	↗
Volume (vph)	157	668	68	22	820	156	0	317	19	0	429	113
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width	10	11	11	10	11	11	11	11	11	11	11	11
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0			5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.92	1.00	0.99			1.00	0.94		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00	1.00		1.00	1.00
Satd. Flow (prot)	1549	3149	1330	1584	3119			1520	1237		1520	1241
Flt Permitted	0.13	1.00	1.00	0.36	1.00			1.00	1.00		1.00	1.00
Satd. Flow (perm)	204	3149	1330	608	3119			1520	1237		1520	1241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.96	0.95	0.95	0.96	0.95	0.95
Adj. Flow (vph)	165	703	72	23	863	164	0	334	20	0	452	119
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	165	703	72	23	1027	0	0	334	20	0	452	119
Confl. Peds. (#/hr)	30		39	39		30			52			18
Heavy Vehicles (%)	3%	5%	2%	0%	2%	4%	2%	3%	0%	4%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	3	0	0	3
Parking (#/hr)								0	0		0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA	Perm		NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	52.7	47.7	47.7	42.8	40.8			39.0	39.0		39.0	39.0
Effective Green, g (s)	52.7	47.7	47.7	42.8	40.8			39.0	39.0		39.0	39.0
Actuated g/C Ratio	0.52	0.47	0.47	0.42	0.40			0.38	0.38		0.38	0.38
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0			5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	223	1476	623	275	1251			582	474		582	475
v/s Ratio Prot	c0.06	0.22		0.00	c0.33			0.22			c0.30	
v/s Ratio Perm	0.32		0.05	0.03					0.02			0.10
v/c Ratio	0.74	0.48	0.12	0.08	0.82			0.57	0.04		0.78	0.25
Uniform Delay, d1	17.7	18.5	15.2	17.3	27.2			24.8	19.6		27.5	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	12.1	1.1	0.4	0.1	6.1			4.1	0.2		9.8	1.3
Delay (s)	29.8	19.6	15.5	17.5	33.3			28.9	19.8		37.3	22.6
Level of Service	C	B	B	B	C			C	B		D	C
Approach Delay (s)		21.1			33.0			28.3			34.3	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group