



Anoka County Highway Department

Traffic Engineering Section

Traffic Volume and Turning Movement Study

Weather: Clear and Mild
 Counter: DB-400
 study conducted by: Andrea/Shannon

*
 Optional Analysis:
 Right Turn Volumes
 removed

File Name : TMC 1331B_rturn_adjust
 Site Code : 13310202
 Start Date : 11/13/2013
 Page No : 1

Groups Printed- Unshifted

Start Time	None Southbound					CSAH 14 Westbound					Cloud Dr. Northbound					CSAH 14 Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total			
06:00	0	0	0	0	0	1	54	0	0	55	2	0	0	0	2	0	63	0	1	63	1	120	121
06:15	0	0	0	0	0	4	70	0	1	74	4	0	0	0	4	0	85	0	2	85	3	163	166
06:30	0	0	0	0	0	2	84	0	1	86	5	0	0	0	5	0	153	0	10	153	11	244	255
06:45	0	0	0	0	0	3	99	0	1	102	6	0	0	0	6	0	152	0	3	152	4	260	264
Total	0	0	0	0	0	10	307	0	3	317	17	0	0	0	17	0	453	0	16	453	19	787	806
07:00	0	0	0	0	0	5	127	0	7	132	17	0	0	0	17	0	148	0	6	148	13	297	310
07:15	0	0	0	0	0	3	104	0	4	107	9	0	0	0	9	0	147	0	4	147	8	263	271
07:30	0	0	0	0	0	14	129	0	3	143	15	0	0	0	15	0	127	0	8	127	11	285	296
07:45	0	0	0	0	0	14	143	0	5	157	16	0	0	1	16	0	154	0	14	154	20	327	347
Total	0	0	0	0	0	36	503	0	19	539	57	0	0	1	57	0	576	0	32	576	52	1172	1224
08:00	0	0	0	0	0	6	104	0	6	110	10	0	0	0	10	0	119	0	9	119	15	239	254
08:15	0	0	0	0	0	1	80	0	2	81	11	0	0	1	11	0	99	0	13	99	16	191	207
08:30	0	0	0	0	0	3	69	0	4	72	10	0	0	0	10	0	79	0	6	79	10	161	171
08:45	0	0	0	0	0	5	85	0	5	90	20	0	0	1	20	0	74	0	11	74	17	184	201
Total	0	0	0	0	0	15	338	0	17	353	51	0	0	2	51	0	371	0	39	371	58	775	833
09:00	0	0	0	0	0	9	79	0	6	88	27	0	0	4	27	0	79	0	11	79	21	194	215
09:15	0	0	0	0	0	6	72	0	4	78	29	0	0	2	29	0	62	0	7	62	13	169	182
09:30	0	0	0	0	0	5	61	0	3	66	9	0	0	0	9	0	69	0	6	69	9	144	153
09:45	0	0	0	0	0	3	63	0	7	66	9	0	0	2	9	0	61	0	6	61	15	136	151
Total	0	0	0	0	0	23	275	0	20	298	74	0	0	8	74	0	271	0	30	271	58	643	701
10:00	0	0	0	0	0	1	60	0	4	61	9	0	0	1	9	0	68	0	5	68	10	138	148
10:15	0	0	0	0	0	2	57	0	4	59	4	0	0	0	4	0	61	0	3	61	7	124	131
10:30	0	0	0	0	0	0	62	0	4	62	5	0	0	0	5	0	52	0	1	52	5	119	124
10:45	0	0	0	0	0	0	70	0	3	70	5	0	0	1	5	0	57	0	2	57	6	132	138
Total	0	0	0	0	0	3	249	0	15	252	23	0	0	2	23	0	238	0	11	238	28	513	541
11:00	0	0	0	0	0	2	62	0	3	64	4	0	0	1	4	0	56	0	4	56	8	124	132
11:15	0	0	0	0	0	2	65	0	6	67	12	0	0	0	12	0	69	0	4	69	10	148	158
11:30	0	0	0	0	0	2	68	0	0	70	11	0	0	1	11	0	70	0	5	70	6	151	157
11:45	0	0	0	0	0	2	52	0	6	54	9	0	0	1	9	0	62	0	3	62	10	125	135
Total	0	0	0	0	0	8	247	0	15	255	36	0	0	3	36	0	257	0	16	257	34	548	582
12:00	0	0	0	0	0	1	61	0	5	62	13	0	0	3	13	0	70	0	4	70	12	145	157
12:15	0	0	0	0	0	3	64	0	4	67	7	0	0	0	7	0	76	0	7	76	11	150	161
12:30	0	0	0	0	0	6	62	0	5	68	7	0	0	0	7	0	70	0	5	70	10	145	155
12:45	0	0	0	0	0	2	46	0	4	48	8	0	0	1	8	0	75	0	5	75	10	131	141
Total	0	0	0	0	0	12	233	0	18	245	35	0	0	4	35	0	291	0	21	291	43	571	614
13:00	0	0	0	0	0	4	49	0	5	53	12	0	0	2	12	0	83	0	2	83	9	148	157
13:15	0	0	0	0	0	0	52	0	1	52	8	0	0	1	8	0	71	0	5	71	7	131	138
13:30	0	0	0	0	0	1	61	0	7	62	10	0	0	1	10	0	72	0	2	72	10	144	154
13:45	0	0	0	0	0	1	64	0	1	65	7	0	0	0	7	0	62	0	4	62	5	134	139
Total	0	0	0	0	0	6	226	0	14	232	37	0	0	4	37	0	288	0	13	288	31	557	588
14:00	0	0	0	0	0	5	90	0	3	95	5	0	0	2	5	0	75	0	4	75	9	175	184
14:15	0	0	0	0	0	4	82	0	3	86	6	0	0	1	6	0	91	0	4	91	8	183	191
14:30	0	0	0	0	0	2	104	0	7	106	8	0	0	2	8	0	84	0	3	84	12	198	210
14:45	0	0	0	0	0	2	91	0	6	93	10	0	0	1	10	0	90	0	8	90	15	193	208
Total	0	0	0	0	0	13	367	0	19	380	29	0	0	6	29	0	340	0	19	340	44	749	793
15:00	0	0	0	0	0	6	103	0	12	109	12	0	0	1	12	0	81	0	2	81	15	202	217
15:15	0	0	0	0	0	4	113	0	6	117	11	0	0	2	11	0	92	0	4	92	12	220	232
15:30	0	0	0	0	0	8	126	0	9	134	13	0	0	2	13	0	107	0	5	107	16	254	270
15:45	0	0	0	0	0	11	163	0	2	174	15	0	0	0	15	0	127	0	8	127	10	316	326
Total	0	0	0	0	0	29	505	0	29	534	51	0	0	5	51	0	407	0	19	407	53	992	1045
16:00	0	0	0	0	0	2	145	0	10	147	47	0	0	7	47	0	112	0	3	112	20	306	326
16:15	0	0	0	0	0	6	168	0	10	174	22	0	0	1	22	0	138	0	2	138	13	334	347
16:30	0	0	0	0	0	5	182	0	2	187	23	0	0	0	23	0	112	0	3	112	5	322	327
16:45	0	0	0	0	0	8	162	0	7	170	15	0	0	2	15	0	141	0	2	141	11	326	337
Total	0	0	0	0	0	21	657	0	29	678	107	0	0	10	107	0	503	0	10	503	49	1288	1337
17:00	0	0	0	0	0	5	154	0	3	159	32	0	0	0	32	0	151	0	1	151	4	342	346
17:15	0	0	0	0	0	3	166	0	1	169	14	0	0	0	14	0	148	0	3	148	4	331	335
17:30	0	0	0	0	0	13	133	0	1	146	31	0	0	0	31	0	139	0	0	139	1	316	317
17:45	0	0	0	0	0	5	141	0	1	146	14	0	0	0	14	0	129	0	2	129	3	289	292
Total	0	0	0	0	0	26	594	0	6	620	91	0	0	0	91	0	567	0	6	567	12	1278	1290



Anoka County Highway Department

Traffic Engineering Section

Traffic Volume and Turning Movement Study

Weather: Clear and Mild
 Counter: DB-400
 study conducted by: Andrea/Shannon

* Optional Analysis:
 Right Turn volumes
 removed

File Name : TMC 1331B_rturn_adjust
 Site Code : 13310202
 Start Date : 11/13/2013
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Groups Printed Unshifted

Start Time	None Southbound					CSAH 14 Westbound					Cloud Dr. Northbound					CSAH 14 Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total	Left	Thru	Right	Heavys	App. Total			
18:00	0	0	0	0	0	4	105	0	2	109	13	0	0	0	13	0	117	0	1	117	3	239	242
18:15	0	0	0	0	0	3	117	0	1	120	12	0	0	0	12	0	101	0	2	101	3	233	236
18:30	0	0	0	0	0	3	86	0	1	89	10	0	0	0	10	0	107	0	2	107	3	206	209
18:45	0	0	0	0	0	4	65	0	0	69	11	0	0	0	11	0	93	0	1	93	1	173	174
Total	0	0	0	0	0	14	373	0	4	387	46	0	0	0	46	0	418	0	6	418	10	851	861
Grand Total	0	0	0	0	0	216	4874	0	208	5090	654	0	0	45	654	0	4980	0	238	4980	491	10724	11215
Apprch %	0	0	0			4.2	95.8	0			100	0	0			0	100	0					
Total %	0	0	0			2	45.4	0		47.5	6.1	0	0		6.1	0	46.4	0		46.4	4.4	95.6	

Start Time	None Southbound				CSAH 14 Westbound				Cloud Dr. Northbound				CSAH 14 Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 06:00 to 11:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	5	127	0	132	17	0	0	17	0	148	0	148	297
07:15	0	0	0	0	3	104	0	107	9	0	0	9	0	147	0	147	263
07:30	0	0	0	0	14	129	0	143	15	0	0	15	0	127	0	127	285
07:45	0	0	0	0	14	143	0	157	16	0	0	16	0	154	0	154	327
Total Volume	0	0	0	0	36	503	0	539	57	0	0	57	0	576	0	576	1172
% App. Total	0	0	0	0	6.7	93.3	0		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.643	.879	.000	.858	.838	.000	.000	.838	.000	.935	.000	.935	.896

Start Time	None Southbound				CSAH 14 Westbound				Cloud Dr. Northbound				CSAH 14 Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 12:00 to 18:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:15																	
16:15	0	0	0	0	6	168	0	174	22	0	0	22	0	138	0	138	334
16:30	0	0	0	0	5	182	0	187	23	0	0	23	0	112	0	112	322
16:45	0	0	0	0	8	162	0	170	15	0	0	15	0	141	0	141	326
17:00	0	0	0	0	5	154	0	159	32	0	0	32	0	151	0	151	342
Total Volume	0	0	0	0	24	666	0	690	92	0	0	92	0	542	0	542	1324
% App. Total	0	0	0	0	3.5	96.5	0		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.750	.915	.000	.922	.719	.000	.000	.719	.000	.897	.000	.897	.968



ANOKA COUNTY HIGHWAY

PC-WARRANTS

TRAFFIC SIGNAL WARRANT ANALYSIS

Study Name : TMC 1331B_rturn_adjust

Study Date : 11/22/13

Page No. : 1

Signal Warrants - Summary

Major Street Approaches *

Eastbound: CSAH 14

Number of Lanes: 1

85% Speed > 40 MPH.

Total Approach Volume: 4,980

Westbound: CSAH 14

Number of Lanes: 1

85% Speed > 40 MPH.

Total Approach Volume: 5,090

*Optional Analysis
Right Turn Volumes
Removed*

Minor Street Approaches

Northbound: Cloud Dr.

Number of Lanes: 1

Total Approach Volume: 654

Southbound: None

Number of Lanes: 1

Total Approach Volume: 0

Warrant Summary (Rural values apply.)

Warrant 1 - Eight Hour Vehicular Volumes Not Satisfied

Warrant 1A - Minimum Vehicular Volume Not Satisfied

Required volumes reached for 1 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic Not Satisfied

Required volumes reached for 6 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants Not Satisfied

Required volumes reached for 3 hours, 8 are needed

Warrant 2 - Four Hour Volumes Satisfied

Number of hours (4) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour Satisfied

Warrant 3A - Peak Hour Delay Satisfied

Number of hours (2) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes Satisfied

Volumes exceed minimums for at least one hour.

Warrant 4 - Pedestrian Volumes Not Evaluated

Warrant 5 - School Crossing Not Evaluated

Warrant 6 - Coordinated Signal System Not Evaluated

Warrant 7 - Crash Experience Not Evaluated

Warrant 8 - Roadway Network Not Evaluated

Warrant 9 - Intersection Near a Grade Crossing Not Evaluated

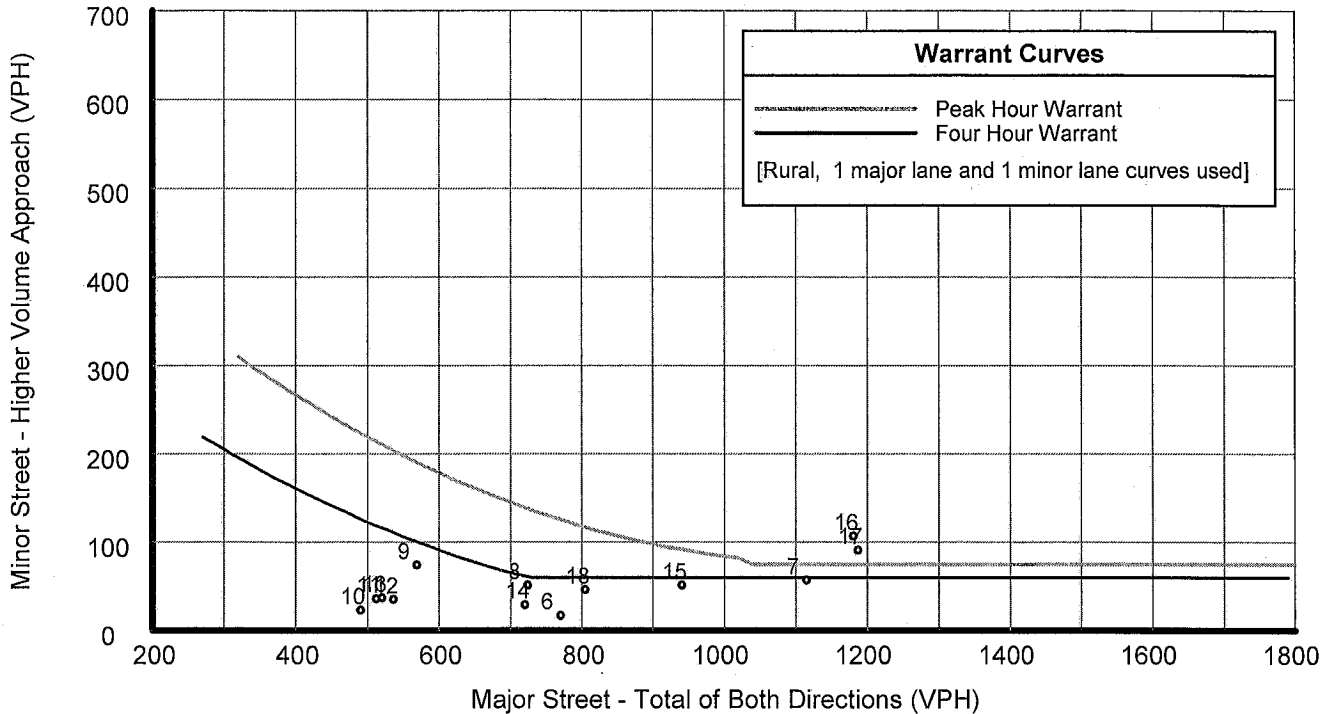


ANOKA COUNTY HIGHWAY PC-WARRANTS TRAFFIC SIGNAL WARRANT ANALYSIS

* Optional Analysis
Right Turn Volumes
removed

Study Name : TMC 1331B_rturn_adjust
Study Date : 11/22/13
Page No. : 2

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

War 1A-Minimum Volume

War 1B-Interruption of Traffic

War 1C-Combination of Warrants

Hour Begin	Major Total	Minor Vol Dir	Maj 350	Min 105	Hour Begin	Major Total	Minor Vol Dir	Maj 525	Min 53	Hour Begin	Major Total	Minor Vol Dir	Maj 420	Min 84
15:45	1,171	107 NB	Yes	Yes	16:15	1,232	92 NB	Yes	Yes	16:15	1,232	92 NB	Yes	Yes
16:45	1,223	92 NB	Yes	No	07:00	1,115	57 NB	Yes	Yes	15:15	1,010	86 NB	Yes	Yes
17:00	1,187	91 NB	Yes	No	17:15	1,103	72 NB	Yes	Yes	08:30	622	86 NB	Yes	Yes
07:00	1,115	57 NB	Yes	No	15:15	1,010	86 NB	Yes	Yes	07:00	1,115	57 NB	Yes	No
15:30	1,113	97 NB	Yes	No	08:15	662	68 NB	Yes	Yes	17:15	1,103	72 NB	Yes	No
17:15	1,103	72 NB	Yes	No	09:15	531	56 NB	Yes	Yes	07:15	1,064	50 NB	Yes	No
07:15	1,064	50 NB	Yes	No	06:45	1,058	47 NB	Yes	No	06:45	1,058	47 NB	Yes	No
06:45	1,058	47 NB	Yes	No	06:30	1,027	37 NB	Yes	No	06:30	1,027	37 NB	Yes	No
06:30	1,027	37 NB	Yes	No	15:00	941	51 NB	Yes	No	17:30	1,007	70 NB	Yes	No
15:15	1,010	86 NB	Yes	No	06:15	932	32 NB	Yes	No	07:30	990	52 NB	Yes	No
17:30	1,007	70 NB	Yes	No	14:45	823	46 NB	Yes	No	15:00	941	51 NB	Yes	No
07:30	990	52 NB	Yes	No	14:30	772	41 NB	Yes	No	06:15	932	32 NB	Yes	No
15:00	941	51 NB	Yes	No	06:00	770	17 NB	Yes	No	17:45	918	49 NB	Yes	No
06:15	932	32 NB	Yes	No	14:15	740	36 NB	Yes	No	07:45	871	47 NB	Yes	No
17:45	918	49 NB	Yes	No	08:00	724	51 NB	Yes	No	14:45	823	46 NB	Yes	No
07:45	871	47 NB	Yes	No	14:00	720	29 NB	Yes	No	18:00	805	46 NB	Yes	No
14:45	823	46 NB	Yes	No	13:45	664	26 NB	Yes	No	14:30	772	41 NB	Yes	No
18:00	805	46 NB	Yes	No	13:30	608	28 NB	Yes	No	06:00	770	17 NB	Yes	No
14:30	772	41 NB	Yes	No	18:15	579	33 NB	Yes	No	14:15	740	36 NB	Yes	No
06:00	770	17 NB	Yes	No	13:15	554	30 NB	Yes	No	08:00	724	51 NB	Yes	No
14:15	740	36 NB	Yes	No	12:15	540	34 NB	Yes	No	14:00	720	29 NB	Yes	No
08:00	724	51 NB	Yes	No	12:00	536	35 NB	Yes	No	13:45	664	26 NB	Yes	No
14:00	720	29 NB	Yes	No	11:30	531	40 NB	Yes	No	08:15	662	68 NB	Yes	No
13:45	664	26 NB	Yes	No	11:45	529	36 NB	Yes	No	13:30	608	28 NB	Yes	No