



Traffic Engineering and Parking Divisions

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TO: Pedestrian/Bicycle/Motor Vehicle Commission
FROM: David C. Dryer, City Traffic Engineer & Parking Manager
SUBJECT: 2006 Traffic Signal Priority List, Summary of Staff Recommendations

1. Old Sauk Road and Westfield Road: Recommend maintaining current stop sign control.
2. Northport Drive and School Road: Recommend maintaining current stop sign control.
3. Raymond Road & Whitney Way: Recommend maintaining current stop sign control.
4. Sixth Street & East Washington Avenue: Recommend installing traffic signal control as part of next year's East Washington reconstruction project.
5. Carver Street and Fish Hatchery Road: Recommend maintaining current stop sign control.

2006 TRAFFIC SIGNAL PRIORITY LIST: SPECIAL STUDIES FOR PBMVC SELECT INTERSECTIONS Actions completed to date

1. **Old Sauk Road & Westfield Road**
Collected 24 hour automatic machine counts.
Collected 7:00 to 9:00 a.m. and 2:00 to 6:00 p.m. manual counts and 4:00 to 6:00 p.m. delay study.
2. **Northport Drive & School Road**
Collected 24 hour automatic machine counts.
Collected 7:00 to 8:00 a.m. and 4:00 to 6:00 p.m. manual counts
3. **Raymond Road & Whitney Way**
Collected 24 hour automatic machine counts.
Reviewed Traffic Impact Study performed for the proposed Meadowood Plaza Re-Development project.
4. **Sixth Street & East Washington Avenue**
Reviewed Traffic Impact Study performed for the Union Corners development and East Washington Avenue reconstruction project traffic projections.
5. **Carver Street & Fish Hatchery Road**
Collected 24 hour automatic machine counts.
Collected 7:00 to 8:00 a.m. and 3:00 to 5:00 p.m. manual counts

2006 TRAFFIC SIGNAL PRIORITY LIST COMMENTARY

Old Sauk Road & Westfield Road

The Old Sauk-Westfield intersection is located on Old Sauk Road approximately 1600 feet west of the signalized intersection at Gammon Road, and approximately 2,900 feet east of the signalized intersection at High Point Road.

Recent manual and automatic hose counts show that this intersection is 25% short of meeting the adopted minimum numerical volume for traffic signals.

A delay study performed during the peak p.m. traffic period showed that the actual delay to motorists on Westfield is 80% short of meeting the minimum delay criteria for traffic signals. The highest 15 minute delay period was found to be from 5:15 – 5:30 p.m. during which time the average delay to motorists on the southbound approach was found to be 44 seconds per vehicle. Delay during this same period was measured at 43 seconds per vehicle in 2003. Average delays recorded during all other time intervals were significantly less.

The crash history for the past five years, 2001 thru 2005, shows there have been an average of 1.4 crashes per year (of crash types considered correctable by traffic signals). A traffic signal would not be expected to improve the safety record of the intersection.

Northport Drive (USH 113) & School Road

The Northport Drive-School Road intersection is located on Northport Drive approximately 1,500 feet east of the signalized intersection at Kennedy Road and approximately 3,500 west of the signalized intersection at Troy Drive. An underpass pedestrian tunnel is provided for crossing Northport on the west leg of the intersection.

Both the eastbound Northport and southbound School Road approaches are located on downward slopes. The westbound Northport approach is located on a slight upward slope.

A Cross Road intersection warning sign with a flashing beacon is provided on the eastbound approach prior to the intersection due to the crest vertical curve on this approach.

The intersection includes a wide grass median area separating the eastbound and westbound Northport Drive traffic lanes. The total width of this area, including the adjacent left-turn lane width, is approximately 32 feet. This wide median area enables motorists to cross Northport in two stages.

Recently collected machine and manual counts indicate that this intersection falls far short of meeting the minimum numerical criteria for signal control.

Due to the slopes of the Northport Drive and School Road approaches, a traffic signal is likely to have a net negative safety effect at this intersection.

Raymond & Whitney Way

Traffic Volumes

- 2006 approach volume per weekday: 9,940 on Whitney Way and 11,174 on Raymond Road
- 2005 approach volume per weekday: 11,700 on Whitney Way and 12,350 on Raymond Road
- 2002 approach volume per weekday: 10,100 on Whitney Way and 12,950 on Raymond Road
- 1999 approach volume per weekday: 9,500 on Whitney Way and 11,800 on Raymond Road

Although these volumes meet the minimum numerical criteria for traffic signals, the present four-way stop control has served this intersection well for the past 20 years.

Crash History

- 2 crashes reported in 2006
- 1.9 per year for the 20 years since the four-way stop was installed in 1985
- 6.8 crashes were reported per year during the 5 years prior to four-way stop control

Experience finds traffic signalization can increase certain crash types, such as rear-end and run-red crashes. Crashes at this intersection may be expected to increase if traffic signals are installed.

Application of Traffic Signal Criteria

These volumes meet the minimum numerical criteria for traffic signals.

Additional Discussion

Computer modeling performed for a 1997 study of this intersection showed:

- Signal control would reduce vehicular delay during the a.m. peak traffic period (7:30 - 8:00 am) and during the p.m. peak traffic period (5:00 - 5:45).
- During the remaining 22+ hours of the day, signal control was expected to result in longer delays.
- Pedestrian delay is also estimated to increase significantly with signal control.

Although a signal would provide pedestrians with a defined crossing period, the large volume of right-turning and left-turning movements which will cross and conflict with the pedestrian movements are factors likely to reduce rather than improve pedestrian safety.

A decision between maintaining the all-way control or installing traffic signals involves, among other things, weighing the importance of responding to requests to have a signalized intersection to reduce delay during peak hours and to remove a "level" of decision-making from motorists as to who has the right-of-way and assigning this to the signal controller thereby making it "easier" to navigate the intersection. The Commission needs to weigh these issues when reaching its conclusion.

Sixth Street & East Washington Avenue

Based on the projected volumes for the reconstructed Sixth Street and East Washington Avenue intersection with the Union Corners redevelopment, this intersection is projected to exceed three of the minimum criteria for installation of traffic signals.

Installation of a traffic signal at Sixth Street and East Washington Avenue was included in the Plan Commission approval of the Union Corners Development.

Carver Street & Fish Hatchery Road

The Carver-Fish Hatchery intersection is located on Fish Hatchery Road approximately 2,350 feet south of the signalized intersection at Wingra Drive, and approximately 2,100 feet north of the signalized intersection at Badger Road.

Recent manual and automatic machine counts show that this intersection is 52% short of meeting the minimum numerical volume for traffic signals.

The crash history for the past five years, 2001 thru 2005, shows that only one crash of a type considered correctable by traffic signals has been reported during this period. A traffic signal would not be expected to improve the safety record of the intersection.

DCD:BJS:gep

2006 TRAFFIC SIGNAL PRIORITY LIST

In accordance with criteria adopted by the transportation commission and common council

	Location	Overall % Below Warrant	WARRANT 1-A				WARRANT 1-B				CRASHES			Pedestrian Warrant	Peak Hour Warrant A	Peak Hour Warrant B	4 Hour Warrant	Comments
			Major Street		Minor Street		Major Street		Minor Street		# With Property Damage Only	# With Personal Injuries	Crash Rate					
			# Hrs.	% Met	# Hrs.	% Met	# Hrs.	% Met	# Hrs.	% Met								
Side Street Stop Controlled Intersections Studied but Not Meeting the Minimum Numerical Requirements of either Warrant 1-A or Warrant 1-B.																		
1	Manchester & McKee (PD)	-9	17	290	1+	46	16	193	7+	91	0	1	0.15	N	-	Y	Y-5 HRS	E F
2	Commerce & Watts	-13	12	128	0	62	5	87	8+	137	1	1	0.37	N	-	N	N-2 HRS	D F
3	Junction and Driveway at Target	-15	13	119	0	85	9	83	10	187	2	0	0.32	N	-	N	Y-7 HRS	
4	Edgewood & Monroe	-19	14	239	0	41	13	159	3	81	0	0	0	N	-	N	N-1 HRS	A B C E F
5	Fordem & Sherman	-21	12	119	1	43	4	109	6+	79	2	2	0.72	N	-	N	N-1 HRS	A C E
6	Old Sauk & Westfield	-25	12	148	0	38	7	99	1	76	0	2	0.36	N	N-0.77	N	N-0 HRS	F
7	Gammon, McKenna & New Washburn	-30	16	208	0	35	12	139	1	70	0	1	0.12	N	-	N	N-0 HRS.	C
8	Bedford & North Shore	-31	14	240	0	35	12	160	3	69	0	0	0	N	-	N	N-2 HRS	D E
9	Franklin & Johnson	-33	17	283	0	34	14	175	0	67	0	0	0	N	-	N	N-0 HRS	
10	Nakoma, Seminole, Yuma	-34	8	110	0	49	2	66	5+	111	0	0	0	N	N-1.08	N	N-0 HRS	F
11	Segoe & Sheboygan	-36	6	96	1+	67	0	64	11+	133	0	0	0	N	-	N	N-0 HRS	A E F
12	Milwaukee & Schenk	-37	15	102	0	33	11	100	6	63	1	0	0.15	N	-	N	N-2 HRS	E
13	High Point & Star Grass	-38	5	100	2+	50	1	62	8	237	0	0	0	N	-	N	N-2 HRS	
14	Colony & Gammon	-39	14	197	0	31	11	131	2	61	0	0	0	N	-	N	N-1 HRS	E
15	Elderberry & Junction	-39	14	217	0	31	12	145	0	61	0	0	0	N	-	N	N-0 HRS	E
16	Knickerbocker & Monroe	-39	12	197	0	31	12	131	0	61	0	1	0.09	N	-	N	N-0 HRS	A D E
17	Butler & Gorham	-39	17	209	0	31	14	139	1	61	0	0	0	N	-	N	N-1 HRS	B
18	Atwood, Miller & Waubesa	-39	15	158	0	31	13	105	0	61	1	0	0.13	N	-	N	N-0 HRS	A E
19	Appleton & Fish Hatchery	-40	16	281	0	30	15	187	1	60	0	0	0	N	-	N	N-0 HRS	A E F
20	Haywood & Park	-40	18	423	0	30	18	282	0	60	2	0	0.12	N	N-0.70	N	N-0 HRS	A D E
21	Gammon, Longmeadow & Stonefield	-40	14	139	0	34	8	93	3	67	0	0	0	N	-	N	N-2 HRS	D E
22	Norman & University (MS)	-42	16	325	0	29	16	216	1	58	0	0	0	N	-	N	N-1 HRS	A C E
23	Mineral Point & Yellowstone	-43	16	466	0	29	14	311	0	57	4	0	0.34	N	N-1.59	N	N-0 HRS	A B E F
24	Ray-O-Vac & Schroeder	-44	9	96	0	46	0	64	5	92	0	0	0	N	-	N	N-0 HRS	
25	Old Middleton & Rosa	-44	11	110	2	56	5	73	6+	42	0	0	0	N	-	N	N-2 HRS	
26	Milwaukee & Waubesa	-44	11	128	0	38	3	84	3	72	0	0	0	N	-	N	N-0 HRS	
27	Johnson, Randall & Engineering Drive	-47	13	146	0	53	5	97	5+	42	0	0	0	-	-	N	N-0 HRS	A B C D E F
28	Cottage Grove (BB) & Thompson	-47	12	133	0	37	4	83	4	70	1	2	0.57	N	-	N	N-0 HRS	
29	Odana & Medical Circle	-48	14	220	0	26	11	147	0	52	0	0	0	N	-	N	N-0 HRS	D
30	Milwaukee & Oak	-48	9	119	0	37	2	79	4	73	0	0	0	N	N-0.94	N	N-0 HRS	F
31	Hammersley & Whitney Way	-50	14	144	1	42	6	96	4+	54	6	0	1.02	N	-	Y	N-1 HRS	
32	Gammon & Tree	-51	14	215	0	30	11	148	1	49	0	3	0.39	N	-	N	N-0 HRS	E F
33	Knutson-Northport	-52	13	197	0	24	13	131	0	48	0	0	0	N	-	N	N-0 HRS	E F
34	Dickinson & East Washington	-52	19	777	0	24	18	518	0	58	2	0	0.1	N	-	N	N-0 HRS	A E
35	Monona (BB), Panther & Tompkins	-52	16	259	0	24	14	173	0	48	1	0	0.12	N	-	N	N-0 HRS	A B E F
36	Sherman & Trailsway	-53	13	142	0	25	8	105	0	47	1	0	0.18	N	-	N	N-0 HRS	
37	Commercial & Nakoosa	-54	0	46	7+	114	0	33	8+	178	0	0	0	N	-	N	N-0 HRS	
38	Bassett & Dayton	-54	2	84	0	44	0	58	6+	88	1	0	0.25	N	-	N	N-1 HRS	E
39	Northport & School	-54	16	416	0	23	15	277	0	46	2	1	0.3	N	-	N	N-0 HRS	B E
40	Heartland & Old Sauk	-55	4	67	4+	68	1	45	6+	300	2	0	0.5	N	-	N	N-2 HRS	
41	Hughes & Park	-55	17	303	0	23	16	202	0	45	1	0	0.08	N	-	N	N-0 HRS	A C D E F
42	Carver & Fish Hatchery (D)	-56	16	282	0	22	14	188	0	44	0	0	0	N	N-0.47	N	N-0 HRS	D
43	Milwaukee & Wittwer	-57	16	149	0	27	7	103	3	43	0	0	0	N	-	N	N-1 HRS	
44	Gilman & Wisconsin	-57	0	65	2	54	0	43	8+	108	0	2	0.18	N	-	N	N-0 HRS	E
45	Prairie & Raymond	-61	14	177	0	24	6	86	2	53	1	1	0.3	N	-	N	N-1 HRS	F
46	Odana Lane & Odana Rd	-61	14	149	0	20	11	99	0	40	0	0	0	N	-	N	N-0 HRS	
47	Packers & Sixth	-61	17	213	0	21	13	131	0	39	1	0	0.12	N	-	N	N-0 HRS	E
48	Blount & Williamson	-62	16	232	0	19	13	154	2	38	0	0	0	N	-	N	N-1 HRS	A E F
49	Plaza & Watts	-64	4	98	0	38	0	65	2	60	2	1	0.9	N	-	N	N-0 HRS	
50	Main & Webster	-65	11	121	0	28	5	80	0	55	0	0	0	N	-	Y	N-3 HRS	E F

	Location	Overall % Below Warrant	WARRANT 1-A				WARRANT 1-B				CRASHES			Pedestrian Warrant	Peak Hour Warrant A	Peak Hour Warrant B	4 Hour Warrant	Comments	
			Major Street		Minor Street		Major Street		Minor Street		# With Property Damage Only	# With Personal Injuries	Crash Rate						
			# Hrs.	% Met	# Hrs.	% Met	# Hrs.	% Met	# Hrs.	% Met									
51	Odana & West Platte	-66	15	267	0	17	14	178	0	34	1	0	0.08	N	-	N	N-0 HRS	ABDEF	
52	Carroll & Doty	-66	11	144	0	34	5	96	1	37	0	0	0	N	-	Y	N-3 HRS	E	
53	Big Sky, Mineral Point & Tree	-68	16	400	0	16	16	267	0	32	1	0	0.09	N	-	N	N-0 HRS	ACEF	
54	Gorham & Henry	-69	16	229	0	16	15	153	0	31	0	0	0	N	-	N	N-0 HRS	E	
55	Mineral Point & Owens	-70	15	181	0	15	11	121	0	30	1	2	0.47	N	-	N	N-0 HRS	ABE	
56	Gilbert & Whitney	-73	16	192	0	13	12	128	0	27	0	0	0	N	-	N	N-0 HRS	ADEF	
57	Aberg & Huxley	-74	11	133	0	23	2	78	0	48	0	0	0	N	-	N	N-0 HRS	F	
58	Johnson & Sixth	-75	9	92	0	31	2	62	1+	63	0	0	0	N	-	N	N-0 HRS		
59	Packers & Schlimgen	-75	19	412	0	13	18	274	0	25	0	0	0	N	-	N	N-0 HRS	CEF	
60	Few & Williamson	-75	15	171	0	18	10	114	0	25	0	0	0	N	-	N	N-0 HRS	AE	
61	MLK Jr. & Wilson	-76	4	69	0	39	0	46	4	78	0	0	0	N	-	N	N-0 HRS		
62	Mineral Point & Westmorland	-77	15	177	0	12	12	118	0	23	0	0	0	N	-	N	N-0 HRS		
63	American Pkwy & American Family Dr	-78	5	153	0	14	3	60	2	62	0	2	0.34	N	-	N	N-0 HRS		
64	Kelab & Segoe	-79	8	99	0	22	0	66	0	44	0	0	0	N	-	N	N-0 HRS	EF	
65	Cottage Grove (BB) & Mc Lean	-80	6	89	0	31	1	59	2	61	0	0	0	N	-	N	N-0 HRS		
66	Blue Ridge & Old Sauk	-80	9	161	0	20	2	70	0	42	0	0	0	N	-	N	N-0 HRS		
67	Cottage Grove & Ellen	-81	6	83	0	29	2	70	6	49	0	0	0	N	-	N	N-0 HRS		
68	Carroll & Dayton	-82	9	110	0	18	1	74	0	27	0	0	0	N	-	N	N-0 HRS	EF	
69	Blackhawk, Erdman & University (MS)	-82	19	671	0	9	17	447	0	18	0	1	0.06	N	-	N	N-0 HRS	ADEF	
70	East Pass, Maple Grove & Westin	-83	0	47	0	43	0	31	4	86	2	0	0.86	N	-	N	N-0 HRS		
71	Scott & Packers (CV)	-84	13	130	0	15	4	87	0	29	0	0	0	N	-	N	N-0 HRS		
72	Milwaukee & Swanton	-85	10	108	0	15	2	72	0	31	1	1	0.28	N	N-2.5	N	N-0 HRS	AEF	
73	Hammersley & McKenna	-85	11	153	0	7	8	102	0	15	0	0	0	N	N-1.00	N	N-0 HRS	F	
74	Roth & Sherman	-86	14	121	0	7	11	107	0	14	0	0	0	N	-	N	N-0 HRS	F	
75	Cottage Grove & McClellan (BB)	-90	8	135	0	10	1	64	0	31	0	0	0	N	-	N	N-0 HRS		
76	Buckeye (AB) & Thompson	-95	3	53	0	30	0	30	6	75	0	0	0	N	-	N	N-0 HRS		
77	Corporate Dr & Blettner	-95	3	68	0	30	0	45	3	60	0	0	0	N	-	N	N-0 HRS		
78	Mineral Point (S) & South Point	-98	7	99	0	3	3	66	0	6	0	0	0	N	-	N	N-0 HRS		
79	Mayfield & Sherman	-132	1	64	0	4	0	40	0	13	0	0	0	N	-	N	N-0 HRS		
80	Midtown, Hawks Landing & Hawks Ridge	Counts to be collected when after area develops										0	0	0					
ALL-WAY STOP INTERSECTIONS STUDIED																			
1	Highland, Regent & Speedway	27	13	141	11	127	5	94	16	254	1	1	0.28	N	-	Y	Y-9 HRS	BC	
2	Raymond & Whitney	4	8	104	14	133	4	69	8+	265	1	1	0.42	N	Y-10.85	Y	Y-8 HRS		
3	Old Middleton & Old Sauk	-17	11	119	4	83	3	79	8+	165	0	0	0	N	-	Y	Y-4 HRS	BF	
4	Swanton & Thompson	-22	2	78	8+	153	0	52	8+	307	0	0	0	N	-	Y	Y-4 HRS	C	
5	High Point & Midtown	-34	6	69	6+	97	1	52	8+	216	0	0	0	N	-	Y	N-3 HRS		
6	American Pkwy, Hoepker & Rattman	-45	2	74	6+	81	0	44	8+	180	0	1	0.23	N	-	Y	N-3 HRS		
7	Milwaukee-Sprecher	-45	4	94	2	56	0	55	8+	143	0	0	0	N	-	N	N-0 HRS		
8	Buckeye (AB) & Vondron	-50	5	70	3	70	0	50	7+	124	0	0	0	N	-	N	N-0 HRS		
TWO-WAY STOP INTERSECTIONS STUDIED AND MEETING THE MINIMUM NUMERICAL REQUIREMENTS OF EITHER WARRANT 1-A OR WARRANT 1-B.																			
1	Carroll & Gorham	17	17	239	0	59	15	159	11	117	0	1	0.16	N	-	Y	Y-7 HRS	EF	
2	McKee (PD) & Muir Field	16	15	172	8+	78	13	116	8+	119	0	0	0	N	-	Y	Y-5 HRS	F	
3	Sixth & East Washington (projected)	13		100+		56		100+		113	1	0	0.5	N		Y	Y		

Warrant 1-A: Eight-Hour Vehicular Volume: Condition A-Minimum Vehicular Volume

Warrant 1-B: Eight-Hour Vehicular Volume: Condition B-Interruption of Continuous Traffic

Y=Yes N=No

Accident Rate: Number of accidents "preventable" with traffic signals per million entering vehicles.

Peak Hour Warrant A: Total vehicle hours of delay is listed for intersections where delay data was collected.

4-Hour Warrant: Number of hours shown are those that exceed the volume thresholds.

The intersections that do not meet the minimum numerical Warrant are listed in order of "closeness" to meeting either Warrant 1-A or Warrant 1-B.

Both the Major and Minor street volumes must meet 100% of the minimum Warrant in order to be classified as "meeting the minimum numerical Warrant."

* Projected 4-Way volumes with Watts Road extension expected in 2003 used for High Point-Watts

Key to Comments:

A = Signal coordination problems

B = Geometric problems

C = Intersection reconstruction needs to be considered.

D = Part of cost could be assessed to benefitting property owners.

E = Coordination with adjacent signals is necessary.

F = "Side Street" volumes adjusted for high right-turn percentage.