Memorandum

The City of Traverse City
Engineering Department

TO: Timothy J. Lodge, P.E., City Engineer

FROM: Jessica L. Cichowski, E.I.T., Engineering Technician

DATE: October 16, 2013

SUBJECT: Cass St at Ninth St Speed Count

City Engineering performed an on-site 3 day speed count beginning Monday, September 30, 2013 at 2 pm until Thursday, October 3, 2013 at 7 pm on Cass St at Ninth St. This memo is to formalize City Engineering's initial findings and observations with regard to the speeds of vehicles on Cass St at Ninth St after an ultrathin pavement overlay and the installation of traffic calming markings.

The data was gathered using a Jamar Radar Recorder which collected traffic data, including vehicle speed, for each lane of traffic (northbound and southbound). This information was then analyzed and the data for each lane compiled into one report, regardless of direction, using TraxPro. The TraxPro report organized the speeds of the vehicles into groups based on 5 mile per hour increments, starting with 0-15 miles per hour. The report shows how many vehicles were within the specified speed range during the time indicated by the report.

During the 3 day study, 28560 vehicles were recorded on this section of Cass Street with 67 percent of the vehicles traveling between 18 and 27 miles per hour and an average speed of 21 miles per hour. About 80 percent of these vehicles were recorded going speeds at or below the posted speed limit of 25 miles per hour. 85 percent of all of the vehicles recorded were traveling at speeds below 26 miles per hour.

A speed study was conducted on this section of Cass St before the ultrathin pavement overlay and installation of traffic calming markings from Thursday, June 27, 2013 to Wednesday, July 3, 2013. The average speed of the vehicles recorded during the study was 21 mph. About 75 percent of these vehicles were recorded going speeds at or below the posted speed limit of 25 miles per hour.

The post-construction average speed is the same as the pre-construction average speed. However, the percent of vehicles traveling above the speed limit decreased by 5 percent after the improvements were made to Cass St.

Post Construction Summary:

- Speed Limit: 25 mph
- Number of Recorded Vehicles (24 hours): 28560
- Percent of Vehicles Over Speed Limit: 19.9 %
- Average Speed: 21 mph
- 10 Mile Per Hour Pace Speed: 18 to 27 mph
- 85th Percentile: 26 mph
- 95th Percentile: 29 mph

Encl. Detailed TraxPro Speed Reports
Cass St at Ninth St Speed Study Pre-Construction Memo

Cass St
(At Ninth St)
Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
09/30/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	20	122	368	**114**	6	0	0	0	0	0	0	0	0	0	630	18-27	434
15:00	37	**160**	362	112	**9**	0	0	0	0	0	0	0	0	0	680	18-27	433
16:00	34	122	**423**	112	8	0	0	0	0	0	0	0	0	0	699	18-27	480
17:00	**46**	136	418	92	9	**1**	0	0	0	0	0	0	0	0	**702**	18-27	467
18:00	18	73	331	105	6	0	0	0	0	0	0	0	0	0	533	19-28	386
19:00	17	75	216	71	6	0	0	0	0	0	0	0	0	0	385	18-27	255
20:00	14	54	147	58	4	0	0	0	0	0	0	0	0	0	277	19-28	179
21:00	5	39	118	30	1	0	0	0	0	0	0	0	0	0	193	18-27	137
22:00	3	17	58	19	4	0	0	0	0	0	0	0	0	0	101	19-28	69
23:00	4	11	32	10	2	0	0	0	0	0	0	0	0	0	59	18-27	37
Total	198	809	2473	723	55	1	0	0	0	0	0	0	0	0	4259		
Percent	4.6%	19.0%	58.1%	17.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	17:00 46	15:00 160	16:00 423	14:00 114	15:00 9	17:00 1									17:00 702		

Cass St
(At Ninth St)
Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
10/01/13	2	6	22	10	0	**2**	0	0	0	0	0	0	0	0	42	20-29	27
01:00	0	1	7	2	0	0	0	0	0	0	0	0	0	0	10	20-29	8
02:00	0	2	5	3	2	0	0	0	0	0	0	0	0	0	12	20-29	7
03:00	0	1	9	3	1	0	0	0	0	0	0	0	0	0	14	19-28	11
04:00	1	3	8	4	3	0	0	0	0	0	0	0	0	0	19	21-30	10
05:00	0	11	28	13	2	2	0	0	0	0	0	0	0	0	56	19-28	37
06:00	5	28	83	37	3	0	0	0	0	0	0	0	0	0	156	19-28	104
07:00	20	87	273	94	5	0	0	0	0	0	0	0	0	0	479	19-28	324
08:00	20	79	301	96	5	1	0	0	0	0	0	0	0	0	502	19-28	351
09:00	19	67	261	108	10	2	0	0	0	0	0	0	0	0	467	19-28	319
10:00	**31**	80	259	108	9	0	0	0	0	0	0	0	0	0	487	19-28	314
11:00	22	**96**	**334**	**125**	**14**	0	0	0	0	0	0	0	0	0	**591**	19-28	403
12 PM	20	127	387	120	12	0	0	0	0	0	0	0	0	0	666	18-27	457
13:00	13	119	363	**150**	6	0	0	0	0	0	0	0	0	0	651	19-28	452
14:00	26	113	334	119	**13**	0	**1**	0	0	0	0	0	0	0	606	19-28	400
15:00	27	125	374	134	7	0	0	0	0	0	0	0	0	0	667	19-28	448
16:00	28	161	392	104	9	0	0	0	0	0	0	0	0	0	694	18-27	462
17:00	**52**	**167**	**433**	90	6	0	0	0	0	0	0	0	0	0	**748**	18-27	488
18:00	15	88	327	110	11	**2**	0	0	0	0	0	0	0	0	553	19-28	389
19:00	20	73	227	79	4	0	0	0	0	0	0	0	0	0	403	19-28	269
20:00	11	43	177	43	4	0	0	0	0	0	0	0	0	0	278	19-28	198
21:00	8	56	114	38	2	0	0	0	0	0	0	0	0	0	218	18-27	141
22:00	4	9	57	27	3	0	0	0	0	0	0	0	0	0	100	20-29	72
23:00	2	12	40	12	2	0	0	0	0	0	0	0	0	0	68	18-27	47
Total	346	1554	4815	1629	133	9	1	0	0	0	0	0	0	0	8487		
Percent	4.1%	18.3%	56.7%	19.2%	1.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	11:00	11:00	00:00									11:00		
Vol.	31	96	334	125	14	2									591		
PM Peak	17:00	17:00	17:00	13:00	14:00	18:00	14:00								17:00		
Vol.	52	167	433	150	13	2	1								748		

Cass St
(At Ninth St)
Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
10/02/13	0	4	14	11	5	0	0	0	0	0	0	0	0	0	34	20-29	22
01:00	2	3	11	6	1	0	0	0	0	0	0	0	0	0	23	19-28	14
02:00	1	5	10	8	1	0	0	0	0	0	0	0	0	0	25	19-28	15
03:00	0	1	9	1	1	0	0	0	0	0	0	0	0	0	12	18-27	10
04:00	1	2	12	5	1	0	0	0	0	0	0	0	0	0	21	19-28	15
05:00	3	13	45	10	3	0	0	0	0	0	0	0	0	0	74	18-27	51
06:00	8	19	72	34	3	0	0	0	0	0	0	0	0	0	136	19-28	90
07:00	**27**	86	265	89	7	**1**	0	0	0	0	0	0	0	0	475	19-28	311
08:00	18	90	319	109	6	0	0	0	0	0	0	0	0	0	542	19-28	379
09:00	26	81	306	123	8	0	0	0	0	0	0	0	0	0	544	19-28	370
10:00	17	86	316	112	7	0	0	0	0	0	0	0	0	0	538	19-28	378
11:00	24	**107**	**320**	**133**	**12**	1	0	0	0	0	0	0	0	0	**597**	19-28	395
12 PM	22	135	**394**	**135**	**13**	**1**	0	0	0	0	0	0	0	0	700	18-27	472
13:00	23	126	378	119	13	1	0	0	0	0	0	0	0	0	660	18-27	446
14:00	23	116	346	112	13	0	0	0	0	0	0	0	0	0	610	18-27	409
15:00	25	158	320	101	6	1	0	0	0	0	0	0	0	0	611	17-26	392
16:00	30	124	391	99	7	0	0	0	0	0	0	0	0	0	651	18-27	446
17:00	**49**	**168**	385	109	5	1	0	0	0	0	0	0	0	0	**717**	18-27	452
18:00	25	74	296	107	11	1	0	0	0	0	0	0	0	0	514	19-28	351
19:00	9	62	249	60	8	0	0	0	0	0	0	0	0	0	388	19-28	282
20:00	14	81	159	51	8	0	0	0	0	0	0	0	0	0	313	17-26	196
21:00	4	48	146	41	3	0	0	0	0	0	0	0	0	0	242	18-27	172
22:00	0	23	72	22	1	0	0	0	0	0	0	0	0	0	118	19-28	86
23:00	6	19	66	16	2	0	0	0	0	0	0	0	0	0	109	18-27	74
Total	357	1631	4901	1613	145	7	0	0	0	0	0	0	0	0	8654		
Percent	4.1%	18.8%	56.6%	18.6%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	11:00	11:00	11:00	07:00									11:00		
Vol.	27	107	320	133	12	1									597		
PM Peak	17:00	17:00	12:00	12:00	12:00	12:00									17:00		
Vol.	49	168	394	135	13	1									717		

Cass St
(At Ninth St)
Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
10/03/13	0	4	22	10	0	0	0	0	0	0	0	0	0	0	36	20-29	28
01:00	3	4	7	13	3	0	0	0	0	0	0	0	0	0	30	23-32	16
02:00	1	4	7	3	0	0	0	0	0	0	0	0	0	0	15	16-25	9
03:00	0	2	9	2	0	0	0	0	0	0	0	0	0	0	13	19-28	10
04:00	1	4	7	4	1	**1**	0	0	0	0	0	0	0	0	18	18-27	10
05:00	2	14	20	16	1	0	0	0	0	0	0	0	0	0	53	19-28	30
06:00	3	17	86	38	7	0	0	0	0	0	0	0	0	0	151	20-29	108
07:00	22	79	263	103	9	0	0	0	0	0	0	0	0	0	476	19-28	318
08:00	13	82	305	86	8	0	0	0	0	0	0	0	0	0	494	19-28	353
09:00	18	69	287	105	**10**	0	0	0	0	0	0	0	0	0	489	19-28	343
10:00	21	73	324	101	8	0	0	0	0	0	0	0	0	0	527	19-28	376
11:00	**25**	**96**	**371**	**140**	6	0	0	0	0	0	0	0	0	0	**638**	19-28	446
12 PM	23	144	**407**	120	9	0	0	0	0	0	0	0	0	0	703	18-27	480
13:00	26	107	387	**132**	**11**	**1**	0	0	0	0	0	0	0	0	664	19-28	458
14:00	31	162	351	102	10	0	0	0	0	0	0	0	0	0	656	18-27	421
15:00	**93**	**206**	272	53	2	1	0	0	0	0	0	0	0	0	627	16-25	347
16:00	36	151	370	84	9	1	0	0	0	0	0	0	0	0	651	17-26	426
17:00	49	173	384	102	5	1	0	0	0	0	0	0	0	0	**714**	17-26	450
18:00	4	45	120	34	1	1	0	0	0	0	0	0	0	0	205	18-27	143
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	371	1436	3999	1248	100	6	0	0	0	0	0	0	0	0	7160		
Percent	5.2%	20.1%	55.9%	17.4%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	11:00	09:00	04:00									11:00		
Vol.	25	96	371	140	10	1									638		
PM Peak	15:00	15:00	12:00	13:00	13:00	13:00									17:00		
Vol.	93	206	407	132	11	1									714		
Total	1272	5430	16188	5213	433	23	1	0	0	0	0	0	0	0	28560		
Percent	4.5%	19.0%	56.7%	18.3%	1.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	14 MPH
50th Percentile :	21 MPH
85th Percentile :	26 MPH
95th Percentile :	29 MPH

Stats

10 MPH Pace Speed :	18-27 MPH
Number in Pace :	19042
Percent in Pace :	66.7%
Number of Vehicles > 25 MPH :	5670
Percent of Vehicles > 25 MPH :	19.9%
Mean Speed(Average) :	21 MPH

Memorandum

The City of Traverse City
Engineering Department

TO: Tim J. Lodge, P.E., City Engineer

FROM: Brogan Beyette, Engineering Intern

DATE: July 3, 2013

SUBJECT: Speed count on Cass St., at the 9th St. intersection

The City of Traverse City Engineering Department conducted an on-site speed count beginning Thursday, June 27, 2013 at 12:00pm and ending Wednesday, July 3, 2013 at 1:00pm on Cass St., at the 9th St. intersection.

The Jamar Radar Recorder gathered data for each lane of traffic; one lane north bound and one lane south bound. The speeds of each vehicle were recorded in the device and then compiled into TraxPro where the lanes were combined into one report, regardless of direction. The report divided the speeds into groups starting with 1-15 mph and each successive group at 5 mph increments. Each group shows how many vehicles were within that specific range of speed and at what times.

The speed limit of Cass St. is 25 mph. According to the enclosed detailed speed report, the average speed of the vehicles was 21 mph. 74.9% of the vehicles were at 25 mph and less with 97.2% of all vehicles at 30 mph and less.

Summary:

- Speed Limit: 25 mph
- Average Speed: 21 mph
- Total Number of Vehicles: 54,633*
- 24-hr ADT Weekday: 9,499 vehicles*
- 24-hr ADT Weekend: 7,997 vehicles*
- 15th Percentile: 14 mph
- 50th Percentile: 21 mph
- 85th Percentile: 26 mph
- 95th Percentile: 29 mph

* Please note that Cherry Festival began Saturday, June 29, 2013 (during this speed count)

Enclosed: Detailed TraxPro Speed Report
Location Map

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
06/27/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	52	147	**410**	124	11	**2**	0	0	0	0	0	0	0	0	**746**	25	28
13:00	13	128	382	156	18	1	0	0	0	0	0	0	0	0	698	26	29
14:00	20	81	372	**182**	8	1	0	0	0	0	0	0	0	0	664	27	29
15:00	21	96	370	167	**25**	1	0	0	0	0	0	0	0	0	680	27	30
16:00	67	172	351	120	16	0	0	0	0	0	0	0	0	0	726	25	29
17:00	**111**	**227**	256	89	8	0	0	0	0	0	0	0	0	0	691	24	27
18:00	27	67	281	167	19	0	0	0	0	0	0	0	0	0	561	27	30
19:00	23	45	226	139	23	2	0	0	0	0	0	0	0	0	458	28	31
20:00	17	42	187	103	13	0	0	0	0	0	0	0	0	0	362	27	30
21:00	8	43	147	82	9	1	0	0	0	0	0	0	0	0	290	27	30
22:00	11	29	89	49	8	0	0	0	0	0	0	0	0	0	186	27	30
23:00	4	21	63	42	4	0	0	0	0	0	0	0	0	0	134	27	30
Total	374	1098	3134	1420	162	8	0	0	0	0	0	0	0	0	6196		
Percent	6.0%	17.7%	50.6%	22.9%	2.6%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	17:00 111	17:00 227	12:00 410	14:00 182	15:00 25	12:00 2									12:00 746		

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
06/28/13	0	7	36	19	6	0	0	0	0	0	0	0	0	0	68	28	32
01:00	1	5	20	7	2	0	0	0	0	0	0	0	0	0	35	27	30
02:00	0	2	12	5	3	0	0	0	0	0	0	0	0	0	22	29	33
03:00	0	4	14	6	1	0	0	0	0	0	0	0	0	0	25	27	30
04:00	0	2	8	5	1	1	0	0	0	0	0	0	0	0	17	29	35
05:00	1	3	27	18	1	1	0	0	0	0	0	0	0	0	51	28	30
06:00	6	13	77	53	8	0	0	0	0	0	0	0	0	0	157	28	30
07:00	18	29	179	117	10	**2**	0	0	0	0	0	0	0	0	355	28	30
08:00	12	50	269	**156**	15	2	0	0	0	0	0	0	0	0	504	27	30
09:00	25	69	292	133	16	1	0	0	0	0	0	0	0	0	536	27	30
10:00	17	95	321	127	**22**	2	0	0	0	0	0	0	0	0	584	27	30
11:00	**43**	**139**	**355**	150	15	0	0	0	0	0	0	0	0	0	**702**	26	29
12 PM	44	**152**	377	144	9	0	0	0	0	0	0	0	0	0	726	26	29
13:00	22	140	358	142	13	1	0	0	0	0	0	0	0	0	676	26	29
14:00	30	142	367	126	13	**2**	0	0	0	0	0	0	0	0	680	26	29
15:00	**50**	145	350	109	14	0	**1**	0	0	0	0	0	0	0	669	25	29
16:00	41	106	381	165	14	1	0	0	0	0	0	0	0	0	708	26	29
17:00	36	116	**385**	**180**	**21**	2	0	0	0	0	0	0	0	0	**740**	27	30
18:00	9	69	288	152	20	0	0	0	0	0	0	0	0	0	538	27	30
19:00	20	54	199	111	12	2	0	0	0	0	0	0	0	0	398	27	30
20:00	14	36	173	115	16	0	0	0	0	0	0	0	0	0	354	28	30
21:00	9	40	152	79	7	0	0	0	0	0	0	0	0	0	287	27	29
22:00	6	37	168	59	8	0	0	0	0	0	0	0	0	0	278	26	29
23:00	8	24	114	46	12	0	0	0	0	0	0	0	0	0	204	27	30
Total	412	1479	4922	2224	259	17	1	0	0	0	0	0	0	0	9314		
Percent	4.4%	15.9%	52.8%	23.9%	2.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	08:00	10:00	07:00									11:00		
Vol.	43	139	355	156	22	2									702		
PM Peak	15:00	12:00	17:00	17:00	17:00	14:00	15:00								17:00		
Vol.	50	152	385	180	21	2	1								740		

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
06/29/13	2	12	47	20	6	0	0	0	0	0	0	0	0	0	87	27	31
01:00	0	12	41	17	5	0	0	0	0	0	0	0	0	0	75	27	31
02:00	0	2	14	13	1	0	0	0	0	0	0	0	0	0	30	28	30
03:00	1	3	11	6	0	0	0	0	0	0	0	0	0	0	21	27	29
04:00	0	1	9	7	1	0	0	0	0	0	0	0	0	0	18	28	31
05:00	4	6	13	4	2	0	0	0	0	0	0	0	0	0	29	26	30
06:00	3	7	29	20	5	0	0	0	0	0	0	0	0	0	64	28	31
07:00	5	14	77	55	14	1	0	0	0	0	0	0	0	0	166	29	32
08:00	4	37	146	66	10	0	0	0	**1**	0	0	0	0	0	264	27	30
09:00	22	57	211	95	11	**2**	0	0	0	0	0	0	0	0	398	27	30
10:00	**33**	80	247	**113**	15	1	0	0	0	0	0	0	0	0	489	27	29
11:00	28	**91**	**305**	109	**19**	0	0	0	0	0	0	0	0	0	**552**	26	29
12 PM	25	102	**329**	122	9	2	0	0	0	0	0	0	0	0	**589**	26	29
13:00	35	102	291	109	**17**	2	0	0	0	0	0	0	0	0	556	26	29
14:00	18	67	232	133	17	1	0	0	0	0	0	0	0	0	468	27	30
15:00	19	108	307	129	17	1	0	0	0	0	0	0	0	0	581	26	29
16:00	16	70	307	**140**	12	0	0	0	0	0	0	0	0	0	545	27	29
17:00	17	73	265	130	13	0	0	0	0	0	0	0	0	0	498	27	29
18:00	20	61	228	123	10	**3**	0	0	0	0	0	0	0	0	445	27	30
19:00	12	62	209	82	12	1	0	0	0	0	0	0	0	0	378	26	30
20:00	16	64	202	74	16	1	0	0	0	0	0	0	0	0	373	26	30
21:00	15	87	203	65	8	1	0	0	0	0	0	0	0	0	379	26	29
22:00	14	60	189	73	5	0	0	0	0	0	0	0	0	0	341	26	29
23:00	**64**	**137**	204	36	5	0	0	0	0	0	0	0	0	0	446	24	26
Total	373	1315	4116	1741	230	16	0	0	1	0	0	0	0	0	7792		
Percent	4.8%	16.9%	52.8%	22.3%	3.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	10:00	11:00	09:00			08:00						11:00		
Vol.	33	91	305	113	19	2			1						552		
PM Peak	23:00	23:00	12:00	16:00	13:00	18:00									12:00		
Vol.	64	137	329	140	17	3									589		

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
06/30/13	7	25	126	62	9	1	0	0	0	0	0	0	0	0	230	27	30
01:00	2	9	47	26	1	1	0	0	0	0	0	0	0	0	86	27	30
02:00	3	6	26	19	4	1	0	0	0	0	0	0	0	0	59	28	32
03:00	1	4	5	5	0	1	0	0	0	0	0	0	0	0	16	28	34
04:00	0	3	9	5	1	1	0	0	0	0	0	0	0	0	19	29	34
05:00	1	2	16	10	2	0	0	0	0	0	0	0	0	0	31	28	31
06:00	1	9	23	20	7	0	0	0	0	0	0	0	0	0	60	29	32
07:00	3	7	60	45	7	0	**1**	0	0	0	0	0	0	0	123	28	31
08:00	9	24	138	88	11	1	0	0	0	0	0	0	0	0	271	28	30
09:00	12	49	194	104	**18**	0	1	0	0	0	0	0	0	0	378	27	30
10:00	43	102	257	**118**	12	**2**	0	0	0	0	0	0	0	0	534	26	29
11:00	**59**	**172**	**330**	93	8	0	0	0	0	0	0	0	0	0	**662**	25	28
12 PM	**89**	220	283	78	6	1	0	0	0	0	0	0	0	0	677	24	27
13:00	67	260	274	62	2	0	0	0	0	0	0	0	0	0	665	23	26
14:00	56	**271**	285	79	8	0	0	0	0	0	0	0	0	0	699	24	27
15:00	38	222	**360**	94	1	1	0	0	0	0	0	0	0	0	**716**	24	27
16:00	32	125	326	102	10	0	0	0	0	0	0	0	0	0	595	25	28
17:00	27	76	276	**125**	11	0	0	0	0	0	0	0	0	0	515	26	29
18:00	18	70	230	103	14	0	0	0	0	0	0	0	0	0	435	27	30
19:00	15	48	218	115	**19**	0	0	0	0	0	0	0	0	0	415	27	30
20:00	17	44	180	91	10	1	0	0	0	0	0	0	0	0	343	27	30
21:00	5	37	123	73	10	**2**	0	0	0	0	0	0	0	0	250	28	30
22:00	7	38	122	40	1	0	**1**	0	0	0	0	0	0	0	209	26	28
23:00	7	23	109	66	7	1	0	0	0	0	0	0	0	0	213	27	30
Total	519	1846	4017	1623	179	14	3	0	0	0	0	0	0	0	8201		
Percent	6.3%	22.5%	49.0%	19.8%	2.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	10:00	09:00	10:00	07:00								11:00		
Vol.	59	172	330	118	18	2	1								662		
PM Peak	12:00	14:00	15:00	17:00	19:00	21:00	22:00								15:00		
Vol.	89	271	360	125	19	2	1								716		

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
07/01/13	4	13	48	25	5	1	0	0	0	0	0	0	0	0	96	28	31
01:00	1	5	18	13	1	0	0	0	0	0	0	0	0	0	38	28	30
02:00	0	6	11	10	2	0	0	0	0	0	0	0	0	0	29	28	31
03:00	0	4	6	2	4	0	0	0	0	0	0	0	0	0	16	31	34
04:00	3	0	6	4	1	**2**	0	0	0	0	0	0	0	0	16	31	37
05:00	2	3	31	11	5	0	0	0	0	0	0	0	0	0	52	28	32
06:00	3	16	58	33	9	0	0	0	0	0	0	0	0	0	119	28	31
07:00	7	26	191	116	21	0	0	0	0	0	0	0	0	0	361	28	31
08:00	20	41	275	131	19	0	0	0	0	0	0	0	0	0	486	27	30
09:00	19	55	280	142	21	0	0	0	0	0	0	0	0	0	517	27	30
10:00	**29**	**92**	284	**158**	**22**	0	0	0	0	0	0	0	0	0	585	27	30
11:00	19	85	**318**	155	20	0	0	0	0	0	0	0	0	0	**597**	27	30
12 PM	30	165	376	131	10	0	0	0	0	0	0	0	0	0	712	26	29
13:00	34	**166**	346	153	**16**	0	0	0	0	0	0	0	0	0	715	26	29
14:00	41	153	394	117	8	0	0	0	0	0	0	0	0	0	713	25	28
15:00	38	148	391	140	13	0	0	0	0	0	0	0	0	0	730	26	29
16:00	25	154	**424**	118	15	0	0	0	0	0	0	0	0	0	736	25	29
17:00	**57**	166	399	119	13	0	0	0	0	0	0	0	0	0	**754**	25	28
18:00	11	92	349	**160**	13	0	0	0	0	0	0	0	0	0	625	27	29
19:00	18	63	243	119	7	0	0	0	0	0	0	0	0	0	450	27	29
20:00	20	48	195	84	12	**1**	0	0	0	0	0	0	0	0	360	27	30
21:00	14	45	144	72	14	1	0	0	0	0	0	0	0	0	290	27	30
22:00	7	43	152	50	5	0	0	0	0	0	0	0	0	0	257	26	29
23:00	11	37	202	92	10	0	0	0	0	0	0	0	0	0	352	27	30
Total	413	1626	5141	2155	266	5	0	0	0	0	0	0	0	0	9606		
Percent	4.3%	16.9%	53.5%	22.4%	2.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	11:00	10:00	10:00	04:00									11:00		
Vol.	29	92	318	158	22	2									597		
PM Peak	17:00	13:00	16:00	18:00	13:00	20:00									17:00		
Vol.	57	166	424	160	16	1									754		

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
07/02/13	6	10	35	25	3	1	0	0	0	0	0	0	0	0	80	28	30
01:00	0	2	27	10	4	0	0	0	0	0	0	0	0	0	43	28	32
02:00	2	6	7	12	1	0	0	0	0	0	0	0	0	0	28	28	30
03:00	0	1	15	6	1	1	0	0	0	0	0	0	0	0	24	28	33
04:00	0	2	7	4	1	**2**	0	0	0	0	0	0	0	0	16	32	37
05:00	1	6	32	12	3	0	0	0	0	0	0	0	0	0	54	27	30
06:00	9	17	60	46	3	0	0	0	0	0	0	0	0	0	135	27	30
07:00	14	35	200	87	18	2	0	0	0	0	0	0	0	0	356	27	30
08:00	17	57	278	150	**23**	1	0	0	0	0	0	0	0	0	526	27	30
09:00	16	67	301	**155**	17	0	0	0	0	0	0	0	0	0	556	27	30
10:00	28	85	**319**	135	14	1	0	0	0	0	0	0	0	0	582	26	29
11:00	**56**	**163**	310	130	10	1	0	0	0	0	0	0	0	0	**670**	26	29
12 PM	38	171	359	127	17	0	0	0	0	0	0	0	0	0	712	26	29
13:00	34	158	**410**	132	15	0	0	0	0	0	0	0	0	0	**749**	26	29
14:00	36	130	378	131	16	**2**	0	0	0	0	0	0	0	0	693	26	29
15:00	44	182	378	102	6	1	0	0	0	0	0	0	0	0	713	25	28
16:00	44	191	346	112	16	1	0	0	0	0	0	0	0	0	710	25	29
17:00	**77**	**214**	308	119	4	0	0	0	0	0	0	0	0	0	722	25	28
18:00	21	108	299	**149**	**21**	0	0	0	0	0	0	0	0	0	598	27	30
19:00	18	65	258	121	11	0	0	0	0	0	0	0	0	0	473	27	29
20:00	13	48	175	106	14	0	0	0	0	0	0	0	0	0	356	27	30
21:00	13	30	200	85	7	0	0	0	0	0	0	0	0	0	335	27	29
22:00	8	34	140	59	7	0	0	0	0	0	0	0	0	0	248	27	29
23:00	5	36	93	62	2	0	0	0	0	0	0	0	0	0	198	27	29
Total	500	1818	4935	2077	234	13	0	0	0	0	0	0	0	0	9577		
Percent	5.2%	19.0%	51.5%	21.7%	2.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	10:00	09:00	08:00	04:00									11:00		
Vol.	56	163	319	155	23	2									670		
PM Peak	17:00	17:00	13:00	18:00	18:00	14:00									13:00		
Vol.	77	214	410	149	21	2									749		

Cass St

(at 9th St intersection)

Speed

Site Code: 00000001
Station ID:

Latitude: 0' 0.0000 South

Direction 1, Direction 2

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	85th Percent	95th Percent
07/03/13	2	10	33	18	4	1	0	0	0	0	0	0	0	0	68	28	31
01:00	0	2	17	10	4	0	0	0	0	0	0	0	0	0	33	29	32
02:00	2	3	11	11	0	0	0	0	0	0	0	0	0	0	27	27	29
03:00	0	3	12	10	0	1	0	0	0	0	0	0	0	0	26	28	31
04:00	2	3	9	10	2	1	0	0	0	0	0	0	0	0	27	29	33
05:00	2	6	28	21	1	1	0	0	0	0	0	0	0	0	59	28	30
06:00	6	17	70	46	11	0	0	0	0	0	0	0	0	0	150	28	31
07:00	15	30	222	120	14	0	0	0	0	0	0	0	0	0	401	27	30
08:00	20	69	282	**143**	15	0	0	0	0	0	0	0	0	0	529	27	30
09:00	28	71	314	140	**19**	**3**	0	0	0	0	0	0	0	0	575	27	30
10:00	28	95	345	138	16	1	0	0	0	0	0	0	0	0	623	26	29
11:00	**30**	**110**	**373**	140	7	1	0	0	0	0	0	0	0	0	**661**	26	29
12 PM	**45**	**193**	**394**	**119**	**16**	**1**	0	0	0	0	0	0	0	0	**768**	25	28
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	180	612	2110	926	109	10	0	0	0	0	0	0	0	0	3947		
Percent	4.6%	15.5%	53.5%	23.5%	2.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	11:00	11:00	08:00	09:00	09:00									11:00		
Vol.	30	110	373	143	19	3									661		
PM Peak	12:00	12:00	12:00	12:00	12:00	12:00									12:00		
Vol.	45	193	394	119	16	1									768		
Grand Total	2771	9794	28375	12166	1439	83	4	0	1	0	0	0	0	0	54633		
Percent	5.1%	17.9%	51.9%	22.3%	2.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	14 MPH
50th Percentile :	21 MPH
85th Percentile :	26 MPH
95th Percentile :	29 MPH

Statistics

10 MPH Pace Speed :	19-28 MPH
Number in Pace :	35031
Percent in Pace :	64.1%
Number of Vehicles > 25 MPH :	13693
Percent of Vehicles > 25 MPH :	25.1%
Mean Speed(Average) :	21 MPH