
Memorandum

The City of Traverse City
Engineering Department



TO: Timothy J. Lodge, P.E., City Engineer
FROM: Abhishek Deora, Seasonal Engineering Aide
DATE: Wednesday, May 31st, 2017
SUBJECT: 24 Hour Speed and Volume of E. Front St near NMC

City Engineering performed a 24 hour speed study on E. Front St near NMC beginning on Tuesday, May 30th, 2017 concluded Wednesday, May 31st, 2017. This memo is to formalize City Engineering's initial data observations and findings with to the speed statistics and volume of vehicular traffic on E. Front St.

The data was gathered using a JAMAR Radar Recorder, this data recorder collects both vehicle speed and volume using radar sensors in both Westbound and Eastbound lanes. The raw data compiled and analyzed using TraxPro and reported vehicle speed count for every hour during the study in the increments of 5 miles per hour. The TraxPro software also compiled a report to be sent Traverse City Police Department to evaluate the possible percentage of enforceable violations. This data is organized into a small colored meter where red means there is a high enforcement potential and green equates to a low amount of speed infractions are occurring. For this report, the enforceable minimum speed a vehicle would need to be traveling is 5 miles per hour over the posted speed limit of 25 miles per hour.

During this 24 hour study, 1317 vehicles were recorded. The average (mean) speed of the 1317 vehicles is 29 miles per hour, with 73.2% of all vehicles traveling at speeds greater than the posted limit of 25 miles per hour. Giving motorist an extra 5 miles per hour over the posted speed limit for enforcement tolerance, the number of vehicles speeding is 41.6%.

Summary (Combined):

- **Mean Speed:** 29 MPH
- **Number of Vehicles above Posted Speed Limit** 73.2%
- **85th Percentile of Speed:** 34 MPH
- **95th Percentile of Speed:** 38 MPH

Enclosed:

Detailed TraxPro Speed Reports (Combined and Directional)
TraxPro Police Enforcement Reports

E Front Street
Between Munson Ave and Huron St
Speed

Site Code: 00000001
Station ID:
E Front St
Between Munson Ave and Huron St
Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Pace Speed	Number in Pace
05/30/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	1	5	12	16	12	0	1	0	0	0	0	0	0	0	47	21-30	28
13:00	0	2	9	14	11	1	0	0	0	0	0	0	0	0	37	25-34	25
14:00	0	3	8	16	7	3	0	0	0	0	0	0	0	0	37	21-30	24
15:00	3	3	10	11	12	5	0	0	0	0	0	0	0	0	44	25-34	23
16:00	3	3	5	19	12	4	1	0	0	0	0	0	0	0	47	26-35	31
17:00	1	2	7	17	19	3	0	0	0	0	0	0	0	0	49	26-35	36
18:00	1	2	1	17	10	8	1	0	0	0	0	0	0	0	40	26-35	27
19:00	1	1	2	7	7	0	0	0	0	0	0	0	0	0	18	26-35	14
20:00	0	1	8	9	11	0	0	0	0	0	0	0	0	0	29	26-35	20
21:00	2	4	1	6	2	3	1	1	0	0	0	0	0	0	20	24-33	8
22:00	1	3	1	4	6	0	0	0	0	0	0	0	0	0	15	26-35	10
23:00	0	1	1	2	0	0	0	0	0	0	0	0	0	0	4	19-28	3
Total	13	30	65	138	109	27	4	1	0	0	0	0	0	0	387		
Percent	3.4%	7.8%	16.8%	35.7%	28.2%	7.0%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

AM Peak Vol.	15:00	12:00	12:00	16:00	17:00	18:00	12:00	21:00	17:00
PM Peak Vol.	3	5	12	19	19	8	1	1	49

E Front Street
Between Munson Ave and Huron St
Speed

Site Code: 00000001
Station ID:
E Front St
Between Munson Ave and Huron St
Latitude: 0' 0.0000 Undefined

Westbound

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
05/31/17	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
01:00	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3	25-34	3
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	24-33	1
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
04:00	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3	20-29	2
05:00	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3	20-29	3
06:00	0	3	4	3	4	1	0	0	0	0	0	0	0	0	15	16-25	7
07:00	3	1	6	9	6	0	1	0	0	0	0	0	0	0	26	21-30	15
08:00	0	3	12	16	12	0	2	0	0	0	0	0	0	0	45	21-30	28
09:00	1	5	7	9	17	0	0	0	0	0	0	0	0	0	39	26-35	26
10:00	2	2	6	10	7	1	0	0	0	0	0	0	0	0	28	24-33	17
11:00	0	6	7	18	17	1	0	0	0	0	0	0	0	0	49	26-35	35
12 PM	0	2	8	8	8	3	0	0	0	0	0	0	0	0	29	21-30	16
13:00	0	0	1	1	0	2	0	0	0	0	0	0	0	0	4	19-28	2
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	7	22	52	81	74	8	3	0	0	0	0	0	0	0	247		
Percent	2.8%	8.9%	21.1%	32.8%	30.0%	3.2%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	08:00	11:00	09:00	06:00	08:00								11:00		
Vol.	3	6	12	18	17	1	2								49		
PM Peak		12:00	12:00	12:00	12:00	12:00									12:00		
Vol.		2	8	8	8	3									29		
Total	20	52	117	219	183	35	7	1	0	0	0	0	0	0	634		
Percent	3.2%	8.2%	18.5%	34.5%	28.9%	5.5%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 20 MPH
50th Percentile : 27 MPH
85th Percentile : 33 MPH
95th Percentile : 36 MPH

Stats
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 402
Percent in Pace : 63.4%
Number of Vehicles > 25 MPH : 445
Percent of Vehicles > 25 MPH : 70.2%
Mean Speed(Average) : 28 MPH

E Front Street
Between Munson Ave and Huron St
Speed

Site Code: 00000001
Station ID:
E Front St
Between Munson Ave and Huron St
Latitude: 0' 0.0000 Undefined

Eastbound																		
Start	1	16	21	26	31	36	41	46	51	56	61	66	71	76		Pace	Number	
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total	Speed	in Pace	
05/30/17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
12 PM	0	3	6	16	13	3	1	0	0	0	0	0	0	0	42	26-35	29	
13:00	0	7	1	13	4	3	0	0	0	0	0	0	0	0	28	26-35	17	
14:00	0	5	8	19	15	3	0	0	0	0	0	0	0	0	50	26-35	34	
15:00	0	2	10	14	21	2	0	0	0	0	0	0	0	0	49	26-35	35	
16:00	1	0	11	13	17	6	1	0	0	0	0	0	0	0	49	26-35	30	
17:00	0	3	5	20	21	9	0	0	0	0	0	0	0	0	58	26-35	41	
18:00	1	1	6	10	12	7	2	1	0	0	0	0	0	0	40	26-35	22	
19:00	0	0	11	5	9	6	0	0	0	0	0	0	0	0	31	21-30	16	
20:00	1	1	6	11	12	3	0	0	0	0	0	0	0	0	34	26-35	23	
21:00	1	0	4	8	6	3	1	0	0	0	0	0	0	1	24	25-34	14	
22:00	1	1	2	5	3	3	0	0	0	0	0	0	0	0	15	24-33	8	
23:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	20-29	4	
Total	5	23	72	136	133	48	5	1	0	0	0	0	0	1	424			
Percent	1.2%	5.4%	17.0%	32.1%	31.4%	11.3%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%				
AM Peak																		
Vol.																		
PM Peak	16:00	13:00	16:00	17:00	15:00	17:00	18:00	18:00							21:00	17:00		
Vol.	1	7	11	20	21	9	2	1							1	58		

E Front Street
Between Munson Ave and Huron St
Speed

Site Code: 00000001
Station ID:
E Front St
Between Munson Ave and Huron St
Latitude: 0' 0.0000 Undefined

Eastbound																	
Start	1	16	21	26	31	36	41	46	51	56	61	66	71	76		Pace	Number
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total	Speed	in Pace
05/31/17	0	0	3	0	1	0	0	0	0	0	0	0	0	0	4	16-25	3
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	29-38	1
02:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	19-28	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	*	1
05:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	14-23	1
06:00	0	3	3	3	5	1	0	0	0	0	0	0	0	0	15	26-35	8
07:00	1	3	2	11	8	3	0	1	0	0	0	0	0	0	29	26-35	19
08:00	1	2	7	12	22	13	1	0	0	0	0	0	0	0	58	31-40	35
09:00	0	2	9	7	3	8	1	0	0	0	0	0	0	0	30	21-30	16
10:00	0	2	4	3	12	1	2	1	0	0	0	0	0	0	25	26-35	15
11:00	0	1	8	7	14	2	0	1	0	0	0	0	0	0	33	26-35	21
12 PM	0	1	7	13	17	7	2	0	0	0	0	0	0	0	47	26-35	30
13:00	1	0	1	4	5	0	0	0	0	0	0	0	0	0	11	26-35	9
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	4	14	46	61	88	37	6	3	0	0	0	0	0	0	259		
Percent	1.5%	5.4%	17.8%	23.6%	34.0%	14.3%	2.3%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	04:00	06:00	09:00	08:00	08:00	08:00	10:00	07:00							08:00		
Vol.	1	3	9	12	22	13	2	1							58		
PM Peak	13:00	12:00	12:00	12:00	12:00	12:00	12:00								12:00		
Vol.	1	1	7	13	17	7	2								47		
Total	9	37	118	197	221	85	11	4	0	0	0	0	0	1	683		
Percent	1.3%	5.4%	17.3%	28.8%	32.4%	12.4%	1.6%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%			

15th Percentile : 22 MPH
50th Percentile : 29 MPH
85th Percentile : 34 MPH
95th Percentile : 38 MPH

Stats
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 418
Percent in Pace : 61.2%
Number of Vehicles > 25 MPH : 519
Percent of Vehicles > 25 MPH : 76.0%
Mean Speed(Average) : 30 MPH

E Front Street
Between Munson Ave and Huron St
Speed

Site Code: 00000001
Station ID:
E Front St
Between Munson Ave and Huron St
Latitude: 0' 0.0000 Undefined

Westbound, Eastbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	999	Total	Pace Speed	Number in Pace
05/31/17	0	0	3	1	1	0	0	0	0	0	0	0	0	0	0	5	21-30	4
01:00	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	4	25-34	3
02:00	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	24-33	2
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	19-28	1
04:00	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	5	20-29	3
05:00	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	5	21-30	4
06:00	0	6	7	6	9	2	0	0	0	0	0	0	0	0	0	30	26-35	15
07:00	4	4	8	20	14	3	1	1	0	0	0	0	0	0	0	55	26-35	34
08:00	1	5	19	28	34	13	3	0	0	0	0	0	0	0	0	103	26-35	62
09:00	1	7	16	16	20	8	1	0	0	0	0	0	0	0	0	69	26-35	36
10:00	2	4	10	13	19	2	2	1	0	0	0	0	0	0	0	53	26-35	32
11:00	0	7	15	25	31	3	0	1	0	0	0	0	0	0	0	82	26-35	56
12 PM	0	3	15	21	25	10	2	0	0	0	0	0	0	0	0	76	26-35	46
13:00	1	0	2	5	5	2	0	0	0	0	0	0	0	0	0	15	26-35	10
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	11	36	98	142	162	45	9	3	0	0	0	0	0	0	0	506		
Percent	2.2%	7.1%	19.4%	28.1%	32.0%	8.9%	1.8%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	09:00	08:00	08:00	08:00	08:00	08:00	07:00									08:00	
Vol.	4	7	19	28	34	13	3	1									103	
PM Peak	13:00	12:00	12:00	12:00	12:00	12:00	12:00										12:00	
Vol.	1	3	15	21	25	10	2										76	
Total	29	89	235	416	404	120	18	5	0	0	0	0	0	0	1	1317		
Percent	2.2%	6.8%	17.8%	31.6%	30.7%	9.1%	1.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%			

15th Percentile : 21 MPH
50th Percentile : 28 MPH
85th Percentile : 34 MPH
95th Percentile : 38 MPH

Stats
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 820
Percent in Pace : 62.3%
Number of Vehicles > 25 MPH : 964
Percent of Vehicles > 25 MPH : 73.2%
Mean Speed(Average) : 29 MPH

Site Code: 0000001
 Station ID:
 E Front St
 Between Munson Ave and Huron St
 Latitude: 0' 0.0000 Undefined

Start Time	29-May-17 Mon	30-May-17 Tue	31-May-17 Wed	01-Jun-17 Thu	02-Jun-17 Fri	Weekday Average	03-Jun-17 Sat	04-Jun-17 Sun
12:00 AM	*	*	5	*	*	5	*	*
01:00	*	*	4	*	*	4	*	*
02:00	*	*	3	*	*	3	*	*
03:00	*	*	1	*	*	1	*	*
04:00	*	*	5	*	*	5	*	*
05:00	*	*	5	*	*	5	*	*
06:00	*	*	30	*	*	30	*	*
07:00	*	*	55	*	*	55	*	*
08:00	*	*	103	*	*	103	*	*
09:00	*	*	69	*	*	69	*	*
10:00	*	*	53	*	*	53	*	*
11:00	*	*	82	*	*	82	*	*
12:00 PM	*	89	76	*	*	82	*	*
01:00	*	65	15	*	*	40	*	*
02:00	*	87	*	*	*	87	*	*
03:00	*	93	*	*	*	93	*	*
04:00	*	96	*	*	*	96	*	*
05:00	*	107	*	*	*	107	*	*
06:00	*	80	*	*	*	80	*	*
07:00	*	49	*	*	*	49	*	*
08:00	*	63	*	*	*	63	*	*
09:00	*	44	*	*	*	44	*	*
10:00	*	30	*	*	*	30	*	*
11:00	*	8	*	*	*	8	*	*
Total	0	811	506	0	0		0	0
Percentage	0.0%	67.9%	42.4%	0.0%	0.0%		0.0%	0.0%
AM Peak	-	-	08:00	-	-	-	-	-
Vol.	-	-	103	-	-	-	-	-
PM Peak	-	17:00	12:00	-	-	-	-	-
Vol.	-	107	76	-	-	-	-	-
Total		811	506					

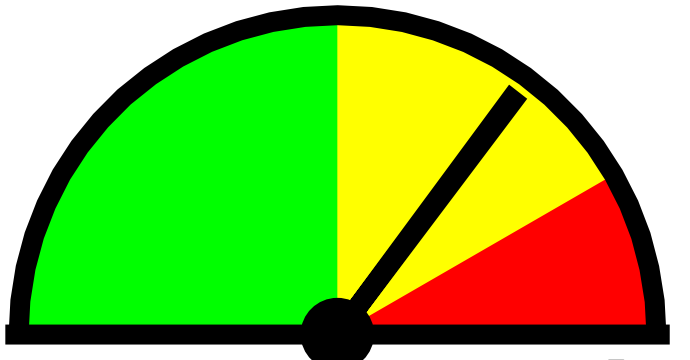
Speed Enforcement Evaluator

Location:
E Front St

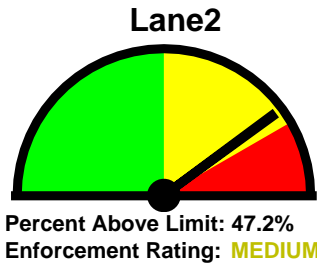
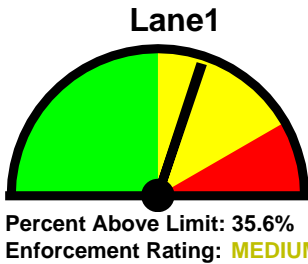
**Total Percentage of
Enforceable Violations**

Closest Cross Street:
Between Munson Ave and Huron St

Analysis Dates:
Tuesday, May 30, 2017
Wednesday, May 31, 2017



0% **59%**
Posted Speed Limit: 25 MPH
Enforcement Tolerance: 5 MPH
Enforcement Limit: 31 MPH & Up
Percentage Above Limit: 41.6%
Enforcement Rating: **MEDIUM**



Combined

1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
1	6	21	89	235	416	404	120	18	5	0	0	0	1

85 percentile = 34

Lane1

1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
1	6	13	52	117	219	183	35	7	1	0	0	0	0

85 percentile = 32

Lane2

1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
0	0	8	37	118	197	221	85	11	4	0	0	0	1

85 percentile = 35

Best Times for Enforcement

Location:
Eastern Ave
Closest Cross Street:
 Between Pinecrest and Sheridan

Analysis Dates:
 Monday, June 05, 2017
 Tuesday, June 06, 2017

Sun

Mon Combined: 4 PM to 6 PM
 Lane1: 4 PM to 6 PM
 Lane2: 5 PM to 7 PM

Tue Combined: Noon to 2 PM
 Lane1: 11 AM to 1 PM
 Lane2: 7 AM to 9 AM

Wed

Thu

Fri

Sat

