Version 2.0.9

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JUN 15 2010
SAN BERNARDINO ASSOCIATED GOVTS

06-14-2010

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

CMP Update 2010

Chino Hills Parkway at Pipeline Aven | **City of Chino Hills** | **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	*L*	*T*	R	L	T	R
Movement 1: 15 secs	X	X	X									
Movement 2: 13 secs		X	X		X	X						
Movement 3: 12 secs				X	X	X						
Movement 4: 12 secs							X			X		
Movement 5: 28 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	3	S	1	2	1	1	2	S	1	2	S
Unadjusted Volume	214	832	40	108	758	183	158	273	255	135	117	119
Peak Hour Factor (PHF)	0.98	0.98	0.98	0.99	0.99	0.99	0.98	0.98	0.98	0.90	0.90	0.90
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd						Shrd			Shrd
Min. Time or Ped. Time	10	19	19	10	19	19	10	28	28	10	24	24
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Parameter Values

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)		1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***		***	***				
Pk. Hr. Vol. (vph)	218	849	41	109	766	185	161	279	260	150	130	132
Saturation Flow (vph)	1800	5400	Shrd	1800	3600	1800	1800	3600	Shrd	1800	3600	Shrd
X or V/C	0.75	0.51	-	0.48	0.74	0.36	0.72	0.46	-	0.67	0.22	-
Effective green (sec)	13	26	-	10	23	23	10	26	-	10	26	-
Split Time (sec)	15	28	-	12	25	25	12	28	-	12	28	-
Min. Time or Ped. Time (sec)	10	19	-	10	19	19	10	28	-	10	24	-
Delay - 15 min pk (sec/veh)	48	23	-	40	31	25	51	23	-	48	20	-
Level of Service (LOS)	D	C+	-	D+	C-	C+	D-	C+	-	D	C+	-
Average 'Q' (veh/ln)	4	4	-	2	6	3	3	4	-	3	2	-
Design 'Q'- ft/ln	120	120	-	60	180	100	100	120	-	100	60	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 29
Level of Service - LOS = C

Critical Movements

Weighted Avg Delay (sec) = 32
Level of Service - LOS = C-
Intersection Capacity Utilization - ICU = 0.64

Required Cycle Length is 80 sec

Min./Ped. Times Satisfied

WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

CMP Update 2010

Chino Hills Parkway at Pipeline Aven **City of Chino Hills** **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	*L*	T	R	L	*T*	R	L	T	R	*L*	*T*	R
Movement 1: 18 secs	X	X	X									
Movement 2: 5 secs		X	X		X	X						
Movement 3: 19 secs				X	X	X						
Movement 4: 17 secs							X			X		
Movement 5: 28 secs								X	X		X	X
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	3	S	1	2	1	1	2	S	1	2	S
Unadjusted Volume	261	752	93	234	705	214	105	336	128	236	355	157
Peak Hour Factor (PHF)	0.96	0.96	0.96	0.96	0.96	0.96	0.92	0.92	0.92	0.94	0.94	0.94
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd						Shrd			Shrd
Min. Time or Ped. Time	10	19	19	10	19	19	10	28	28	10	24	24
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Parameter Values

	Other	Default
Duraticn of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)		1800
Sat Flow (2 Left lanes, vphg)	3200	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

	***				***					***	***	
Pk. Hr. Vol. (vph)	272	783	97	244	734	223	114	365	139	251	378	167
Saturation Flow (vph)	1800	5400	Shrd	1800	3600	1800	1800	3600	Shrd	1800	3600	Shrd
X or V/C	0.82	0.68	-	0.69	0.81	0.49	0.37	0.47	-	0.81	0.51	-
Effective green (sec)	16	21	-	17	22	22	15	26	-	15	26	-
Split Time (sec)	18	23	-	19	24	24	17	28	-	17	28	-
Min. Time or Ped. Time (sec)	10	19	-	10	19	19	10	28	-	10	24	-
Delay - 15 min pk (sec/veh)	54	33	-	43	38	31	35	26	-	55	27	-
Level of Service (LOS)	D-	C-	-	D	D+	C-	D+	C	-	D-	C	-
Average 'Q' (veh/ln)	6	5	-	5	7	4	2	4	-	5	5	-
Design 'Q'- ft/ln	180	160	-	160	220	120	60	120	-	160	160	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 36
Level of Service - LOS = D+

Critical Movements

Weighted Avg Delay (sec) = 39
Level of Service - LOS = D+
Intersection Capacity Utilization - ICU = 0.71

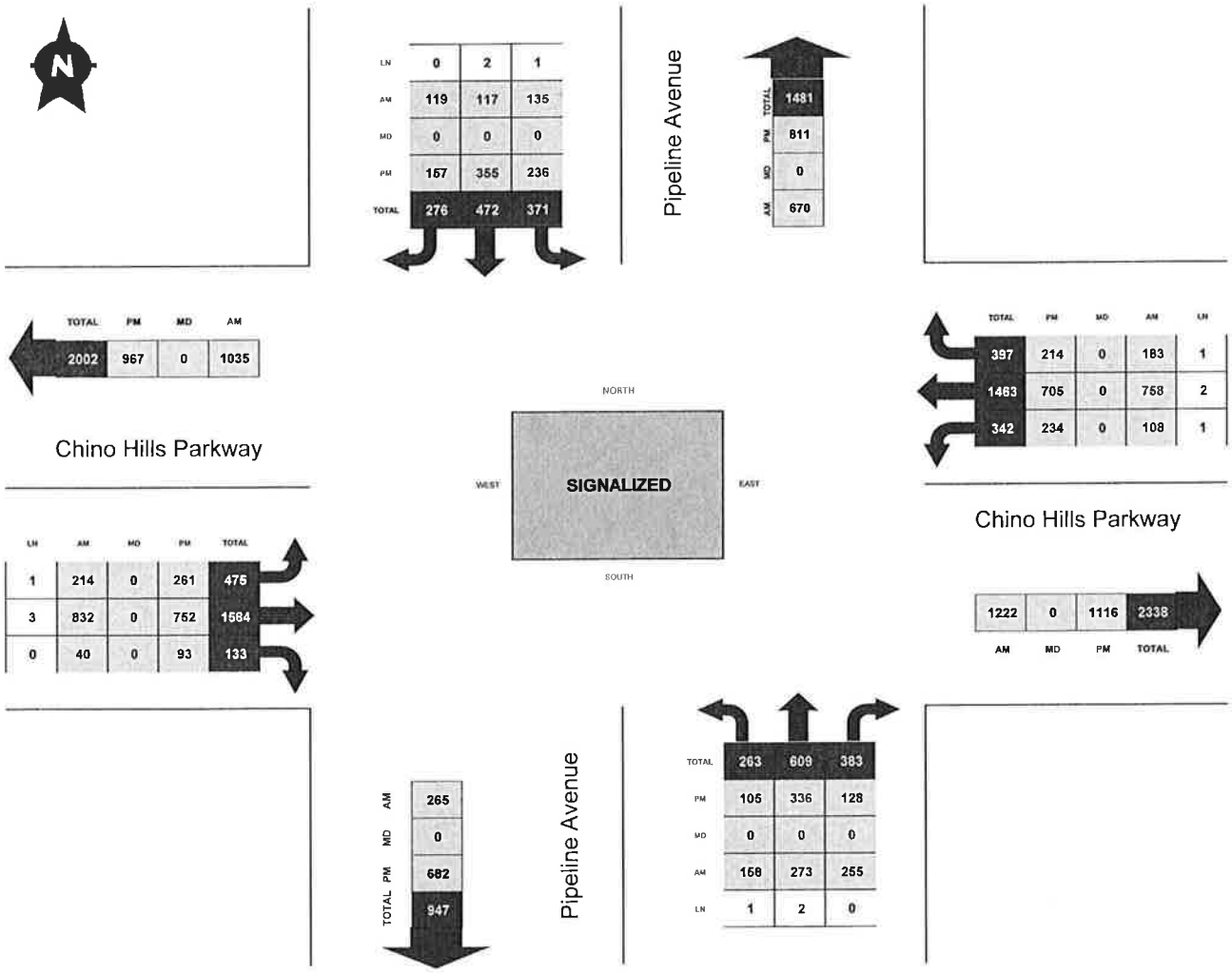
Required Cycle Length is 87 sec

Min./Ped. Times Satisfied

PEAK HOUR ITM SUMMARY

#002 Pipeline Avenue & Chino Hills Parkway

LOCATION:	002	QTD PROJ#:	100148	AM PEAK:	715 AM
NORTH / SOUTH:	Pipeline Avenue	DATE:	Wednesday, June 09, 2010	MD PEAK:	
EAST / WEST:	Chino Hills Parkway	VICINITY:	Chino Hills, CA	PM PEAK:	445 PM



AM COUNT	7:00AM	TO	9:00 AM	MD COUNT	-	TO	-	PM COUNT	4:00 PM TO 6:00 PM

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VEHICLE TURNING ...OVEMENT COUNT

#002 Pipeline Avenue & Chino Hills Parkway - AM PEAK

LOCATION#:	002	QTD PROJ#:	100148
NORTH / SOUTH:	Pipeline Avenue	DATE:	Wednesday, June 09, 2010
EAST / WEST:	Chino Hills Parkway	VICINITY:	Chino Hills, CA

DIRECTION:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTALS
LANES:	1	2	0	1	2	0	1	3	0	1	2	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	44	50	70	35	25	29	42	207	9	24	181	53	769
7:15 AM	37	59	76	32	23	35	53	216	12	30	189	45	807
7:30 AM	42	63	69	31	27	31	46	215	9	25	197	42	797
7:45 AM	36	71	58	29	34	26	55	203	8	23	190	50	783
8:00 AM	43	80	52	43	33	27	60	198	11	30	182	46	805
8:15 AM	37	79	50	34	27	33	53	202	16	25	176	59	791
8:30 AM	31	72	48	38	35	38	50	195	14	24	179	48	772
8:45 AM	35	65	50	34	26	31	46	189	16	28	183	57	760
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
VOLUME STATS:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
TOTAL:	305	539	473	276	230	250	405	1625	95	209	1477	400	6284
P.H.V: (1)	158	273	255	135	117	119	214	832	40	108	758	183	3192
P.H.F: (2)		0.980			0.900			0.966			0.993		0.989

(1) Peak Hour Volume (Peak Hour Begins At 715 AM)
(2) Peak Hour Factor (directional aggregate)

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VEHICLE TURNING MOVEMENT COUNT

#002 Pipeline Avenue & Chino Hills Parkway - PM PEAK

LOCATION#:	002	QTD PROJ#:	100148
NORTH / SOUTH:	Pipeline Avenue	DATE:	Wednesday, June 09, 2010
EAST / WEST:	Chino Hills Parkway	VICINITY:	Chino Hills, CA

													TOTALS
LANES:	1	2	0	1	2	0	1	3	0	1	2	1	
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	23	63	35	63	79	29	53	183	24	48	149	52	801
4:15 PM	30	67	38	70	76	24	61	189	30	55	155	57	852
4:30 PM	26	75	36	61	83	30	68	182	21	64	161	54	861
4:45 PM	21	89	37	56	84	35	72	190	24	61	164	55	888
5:00 PM	31	90	33	57	94	37	64	196	19	58	173	60	912
5:15 PM	27	85	26	65	85	38	66	187	26	54	179	48	886
5:30 PM	26	72	32	58	92	47	59	179	24	61	189	51	890
5:45 PM	22	85	28	50	86	40	50	186	25	53	180	59	864
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													
TOTAL:	206	626	265	480	679	280	493	1492	193	454	1350	436	6954
P.H.V: (1)	105	336	128	236	355	157	261	752	93	234	705	214	3576
P.H.F: (2)		0.924			0.949			0.967			0.958		0.980

(1) Peak Hour Volume (Peak Hour Begins At 445 PM)
(2) Peak Hour Factor (directional aggregate)

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VEHICLE CLASSIFICATIONS

LOCATION:	Chino Hills Parkway and Pipeline Avenue	PROJECT #	100145
DIRECTION:	EASTBOUND	LOCATION #	002
VICINITY:	Chino Hills, CA	START DATE:	Wednesday, May 26, 2010

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	72	0	0	0	0	0	0	0	0	0	0	0	72
1:00	2	50	0	0	0	0	0	0	0	0	0	0	0	52
2:00	0	27	0	0	0	0	0	0	0	0	0	0	0	27
3:00	0	42	0	0	0	0	0	0	0	0	0	0	0	42
4:00	0	131	0	0	0	0	0	0	0	0	0	0	0	131
5:00	3	244	1	0	0	0	0	0	0	0	0	0	0	248
6:00	6	355	2	0	2	1	1	1	0	0	0	0	0	368
7:00	12	720	1	16	6	0	2	6	12	0	0	0	0	777
8:00	9	630	2	23	4	5	3	2	16	0	0	0	0	694
9:00	7	589	4	14	5	3	1	3	5	0	0	0	0	631
10:00	14	514	3	9	2	1	1	3	4	0	1	0	0	552
11:00	22	610	4	8	2	1	1	2	7	0	0	0	0	657
12:00	13	669	7	13	3	2	2	2	3	0	0	0	1	715
13:00	10	624	5	25	6	3	1	4	4	0	0	0	0	682
14:00	36	628	8	17	7	1	2	5	5	0	0	0	2	711
15:00	45	774	16	42	6	0	2	15	15	0	1	0	0	916
16:00	28	833	12	63	11	5	4	15	21	1	0	1	2	996
17:00	18	778	10	63	9	3	3	18	24	2	1	0	1	930
18:00	15	812	5	60	7	2	0	12	17	0	1	1	2	934
19:00	13	638	2	15	2	1	1	2	7	2	0	0	1	684
20:00	17	529	1	5	0	2	1	0	5	0	0	0	0	560
21:00	5	340	0	2	0	0	0	0	0	0	0	0	0	347
22:00	9	238	0	1	0	0	0	0	0	0	0	0	0	248
23:00	7	108	0	0	0	0	0	0	0	0	0	0	0	115
TOTAL	291	10955	83	378	72	30	25	90	145	5	4	2	9	12089
% of Total:	2%	91%	1%	3%	1%	0%	0%	1%	1%	0%	0%	0%	0%	

7 - 9 AM Peak Total	12 - 2 PM Peak Total	4 - 6 PM Peak Total
1471	1397	1926

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VEHICLE CLASSIFICATIONS

LOCATION:	Chino Hills Parkway and Pipeline Avenue	PROJECT #	100145
DIRECTION:	WESTBOUND	LOCATION #	002
VICINITY:	Chino Hills, CA	START DATE:	Wednesday, May 26, 2010

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	117	3	0	3	1	0	0	1	0	0	0	0	125
1:00	0	70	3	0	0	0	0	0	0	0	0	0	0	73
2:00	0	51	1	0	0	0	0	0	1	0	0	0	0	53
3:00	0	39	2	0	1	0	0	0	0	0	0	0	0	42
4:00	0	74	5	1	3	0	0	1	0	0	0	0	0	84
5:00	6	188	29	7	2	2	0	3	3	0	0	0	1	241
6:00	9	442	59	15	11	7	3	13	1	0	1	1	0	562
7:00	24	611	71	28	14	13	5	26	10	0	3	0	0	805
8:00	17	495	50	31	13	12	1	33	10	0	2	0	0	664
9:00	11	460	54	4	14	6	0	16	7	0	1	0	0	573
10:00	10	442	56	10	21	10	0	10	7	0	1	0	0	567
11:00	18	527	67	27	8	14	3	30	8	0	0	0	0	702
12:00	28	600	55	25	12	15	2	28	7	0	3	0	0	775
13:00	24	603	56	32	14	16	7	25	5	0	0	1	0	783
14:00	30	625	60	40	9	19	7	47	14	1	4	0	1	857
15:00	24	634	67	38	21	12	2	38	11	0	4	0	2	853
16:00	31	634	74	38	16	16	2	40	7	0	3	0	1	862
17:00	31	664	56	41	14	11	3	51	16	0	2	0	0	889
18:00	24	725	50	25	11	15	0	27	7	0	0	0	0	884
19:00	20	639	45	27	12	10	4	21	7	0	2	0	0	787
20:00	17	547	43	11	6	5	2	10	5	0	1	0	0	647
21:00	10	488	33	12	8	7	3	11	2	0	1	0	0	575
22:00	7	344	26	6	1	2	0	5	0	0	0	0	0	391
23:00	2	235	12	0	2	0	0	0	0	0	0	0	0	251
TOTAL	343	10254	977	418	216	193	44	435	129	1	28	2	5	13045
% of Total:	3%	79%	7%	3%	2%	1%	0%	3%	1%	0%	0%	0%	0%	

7 - 9 AM Peak Total	12 - 2 PM Peak Total	4 - 6 PM Peak Total
1469	1558	1751

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VEHICLE CLASSIFICATIONS

LOCATION:	Chino Hills Parkway and Pipeline Avenue	PROJECT #	100145
DIRECTION:	NORTHBOUND	LOCATION #	002
VICINITY:	Chino Hills, CA	START DATE:	Wednesday, May 26, 2010

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	0	41	1	0	0	0	0	0	0	0	0	0	0	42
1:00	0	29	0	0	0	0	0	0	0	0	0	0	0	29
2:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
3:00	0	35	0	0	1	0	0	0	1	0	0	0	0	37
4:00	1	94	9	0	2	0	0	0	0	0	0	0	0	106
5:00	1	234	12	0	2	0	0	1	0	0	0	0	0	250
6:00	4	386	25	1	0	2	0	0	0	0	0	0	0	418
7:00	2	539	32	1	5	2	1	4	0	0	0	0	0	586
8:00	5	492	21	5	3	4	0	2	0	0	0	0	0	532
9:00	5	380	27	2	4	1	0	0	0	0	0	0	0	419
10:00	2	367	19	0	4	2	0	1	2	0	0	0	0	397
11:00	1	394	13	1	7	0	0	1	0	0	0	0	0	417
12:00	1	424	28	3	3	3	0	4	0	0	0	0	0	466
13:00	3	435	16	2	0	3	1	1	0	0	0	0	0	461
14:00	6	428	19	1	3	0	0	2	0	0	0	0	0	459
15:00	4	411	24	1	3	0	0	7	0	0	0	0	0	450
16:00	0	432	26	4	1	2	0	2	0	0	0	0	0	467
17:00	2	427	20	1	0	1	1	7	0	0	0	0	0	459
18:00	0	435	24	6	2	1	0	3	1	0	0	0	0	472
19:00	4	411	17	0	0	0	1	2	0	0	0	0	0	435
20:00	1	290	9	1	1	0	0	1	0	0	0	0	0	303
21:00	0	189	3	0	0	0	0	1	0	0	0	0	0	193
22:00	0	131	0	0	0	0	0	0	0	0	0	0	0	131
23:00	0	79	1	0	0	0	0	0	0	0	0	0	0	80
TOTAL	42	7096	346	29	41	21	4	39	4	0	0	0	0	7622
% of Total:	1%	93%	5%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	

7 - 9 AM Peak Total	12 - 2 PM Peak Total	4 - 6 PM Peak Total
1118	927	926

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VEHICLE CLASSIFICATIONS

LOCATION:	Chino Hills Parkway and Pipeline Avenue	PROJECT #	100145
DIRECTION:	SOUTHBOUND	LOCATION #	002
VICINITY:	Chino Hills, CA	START DATE:	Wednesday, May 26, 2010

Time	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12	#13	Total
0:00	1	55	0	0	1	0	0	0	1	0	0	0	0	58
1:00	1	36	0	0	0	0	0	0	0	0	0	0	0	37
2:00	0	22	0	0	0	0	0	0	0	0	0	0	0	22
3:00	0	17	0	0	0	0	0	0	0	0	0	0	0	17
4:00	1	12	0	0	0	0	0	0	0	0	0	0	0	13
5:00	0	64	4	0	2	1	0	0	0	0	0	0	0	71
6:00	3	142	3	0	1	0	0	0	0	0	0	0	0	149
7:00	6	258	4	1	2	0	0	0	0	0	0	0	0	271
8:00	5	284	6	0	3	0	0	0	0	0	0	0	0	298
9:00	10	290	12	0	3	2	0	1	1	0	0	0	0	319
10:00	6	358	3	1	3	1	0	0	0	0	0	0	0	372
11:00	4	431	10	1	3	3	0	0	0	0	0	0	0	452
12:00	3	499	9	1	2	2	1	2	1	0	0	0	0	520
13:00	6	491	5	3	3	1	0	0	0	0	0	0	0	509
14:00	7	455	6	5	2	3	1	0	0	0	0	0	0	479
15:00	14	549	7	3	2	0	1	3	2	0	0	0	1	582
16:00	9	536	2	7	2	1	0	0	0	0	0	0	0	557
17:00	12	550	6	8	0	0	0	4	0	1	0	0	0	581
18:00	9	596	8	3	2	0	0	0	1	0	0	0	0	619
19:00	16	516	3	4	1	0	0	1	1	0	0	0	0	542
20:00	15	566	5	5	1	1	1	2	1	0	0	0	0	597
21:00	8	357	1	2	2	0	1	1	0	0	0	0	0	372
22:00	2	207	0	1	0	0	0	0	0	0	0	0	0	210
23:00	0	140	1	0	1	0	0	0	0	0	0	0	0	142
TOTAL	138	7431	95	45	36	15	5	14	8	1	0	0	1	7789
% of Total:	2%	95%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	

7 - 9 AM Peak Total	12 - 2 PM Peak Total	4 - 6 PM Peak Total
569	1029	1138

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