8th Ave Study

25th St to 28th St

Prepared For:
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May 2015

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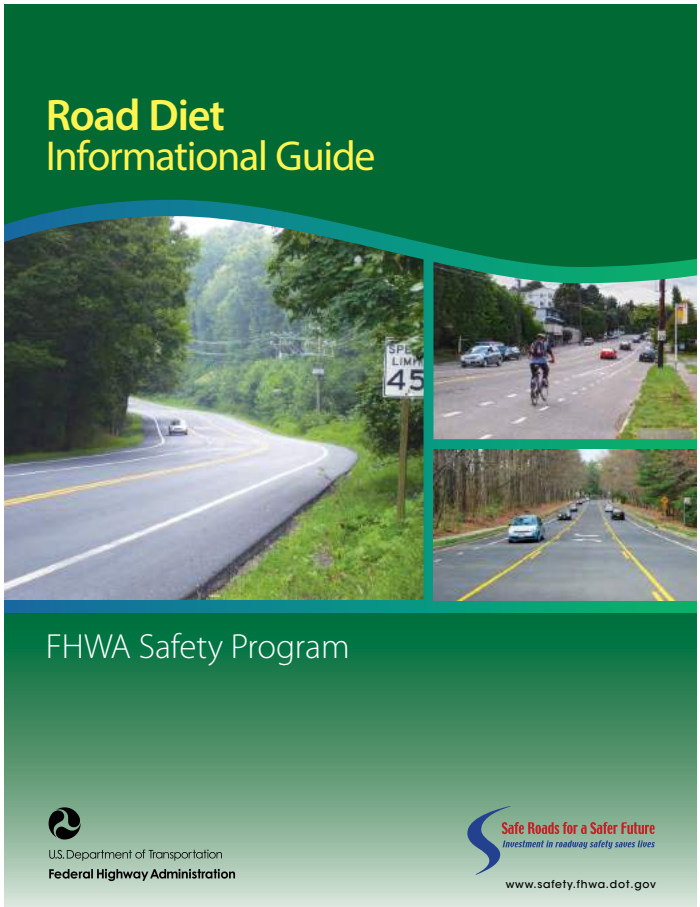
Purpose

8th Ave is presently has a 5 lane section. There are 2 through lanes in each direction and a center left turn lane. This study was initiated to determine if 8th Ave could function properly as a 3 lane section by removing one through lane in each direction. With a 3 lane section, the extra street width could be used as a bicycle lane, parking, landscaping, or sidewalk. The study will also identify the problem areas that need additional focus.

Standards

The Federal Highway Administration (FHWA) has published an informational guide titled Road Diet. This document gives guidelines on how to proceed when narrowing roadways.

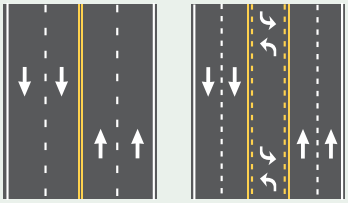
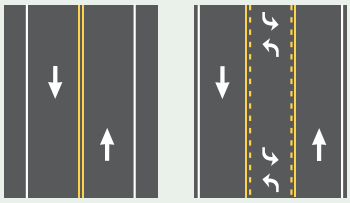
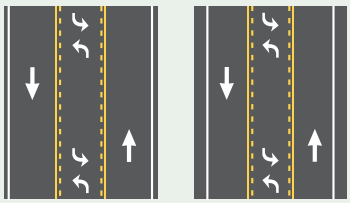
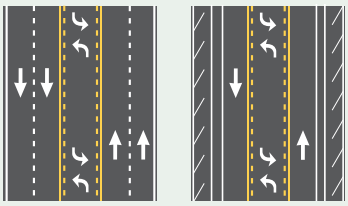


Road Diet Informational Guide

The guide gives several examples of the types of roadways that can be modified. The Figure below shows some of these examples. The drawing on the bottom right is similar to what is being considered for 8th Ave.

Other Roadway Reconfigurations

In addition to four- to three-lane configurations, other roadway reconfigurations, such as those depicted below, can also provide safety benefits:

4-lane to 5-lane: In some cases it is necessary to keep two lanes in each direction for capacity purposes. Narrowing lane width to provide a TWLTL introduces the benefits of separating turning vehicles and reducing operating speeds.	
2-lane to 3-lane: If a capacity expansion of an existing two-lane road is desired, in some cases a three-lane cross section can provide similar operational benefits to a four-lane cross section while maintaining the safety benefits of the three-lane configuration.	
3-lane to 3-lane: In some cases practitioners could reduce the width of each lane instead of reducing the number of lanes. Converting an existing three-lane roadway to a three-lane cross section with narrowed lanes can accommodate bicycle lanes or parking, and provide some traffic calming benefit.	
5-lane to 3-lane In some cases jurisdictions have reconfigured five-lane sections to three lanes, adding features such as diagonal parking and protected bicycle lanes with the extra cross section width.	

Other Combinations: Some cases may require allocating the cross section differently by providing unbalanced lane splits (e.g., two in one direction, one in the other), separated left turn lanes for opposite directions, or providing shoulders for other uses (e.g., parking, bicycle lanes, sidewalks). The basic concepts of Road Diets still apply, although in some cases there may be different safety and operational effects than with a classic 4-to-3 Road Diet.

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Types of Roadways

The guide also recommends total maximum volumes when considering. Various entities use maximums from 15,000 to 25,000 vehicles per day. The FHWA recommends roadway have less than 20,000 vehicles per day when considering road diets. The Figure below shows these volumes.

Some of the following general trends are expected.

- Pedestrian LOS scores are likely to improve due to the lane reduction, speed reduction, and the reallocation of traveled way width to bicycle lanes and on-street parking.
- Bicycle LOS scores will improve as a result of some of the same factors, as well as the addition of a bicycle lane.
- Applying a Road Diet configuration on a corridor with frequent signalized intersections will have a larger impact on automobile operations than it would on a corridor with more infrequent signal spacing. Frequently spaced signals are more likely to have queued traffic back up into adjacent signals' effective areas, causing congestion issues at multiple intersections. In some cases this impact can be mitigated by optimizing the signal timing and coordinating between signals. The arterial automobile LOS will provide a more accurate view of conditions when there are longer distances between signalized intersections or only unsignalized intersections in the corridor.
- The following factors will affect automobile LOS, as measured by vehicle speed: signal spacing, access point frequency, number of left-turning vehicles, and number of lanes.

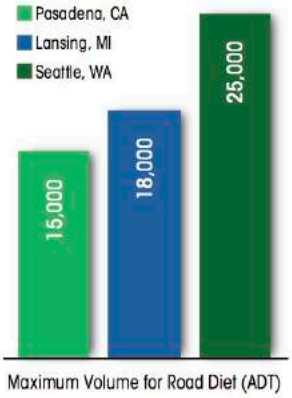

Figure 12. Road Diet Implementation Maximum Volume Thresholds by Agency

One study conducted a sensitivity analysis to determine at what hourly volume the arterial LOS would decline. It found that a two-way peak hour volume of 1,750 vehicles per hour (875 each direction) was the threshold when a decrease in LOS was observed.[33] It also found this could be mitigated by signal timing optimization.[34]

3.3.5 Average Daily Traffic (ADT)

The ADT provides a good first approximation on whether or not to consider a Road Diet conversion. If the ADT is near the upper limits of the study volumes, practitioners should conduct further analysis to determine its operational feasibility. This would include looking at peak hour volumes by direction and considering other factors such as signal spacing, turning volumes at intersections, and other access points. Each practitioner should use engineering judgment to decide how much analysis is necessary and take examples from this report as a guide.

- A 2011 Kentucky study showed Road Diets could work up to an ADT of 23,000 vehicles per day (vpd).[35]
- In 2006, Gates, et al. suggested a maximum ADT of between 15,000 and 17,500 vpd.[36]

Knapp, Giese, and Lee have documented Road Diets with ADTs ranging from 8,500 to 24,000 vpd.[37] The FHWA advises that roadways with ADT of 20,000 vpd or less may be good candidates for a Road Diet and should be evaluated for feasibility. Figure 12 shows the maximum ADTs used by several agencies to determine whether to install a Road Diet. Road Diet projects have been completed on roadways with relatively high traffic volumes in urban areas or near larger cities with satisfactory results.

3.3.6 Peak Hour and Peak Direction

The peak hour volume in the peak direction will be the measure of volume driving the analysis and can determine whether the Road Diet can be feasibly implemented. This is the traffic volume that would be used in calculating LOS analysis for intersections or the arterial corridor.

Peak-hour volumes along urban roadways typically represent 8 to 12 percent of the ADT along a roadway. The Iowa guidelines suggest, from an operational point of view, the following volume-based Road Diet feasibility conclusions (assuming a 50/50 directional split and 10 percent of the ADT during the peak hour):[38]

- Probably feasible at or below 750 vehicles per hour per direction (vphpd) during the peak hour.
- Consider cautiously between 750 – 875 vphpd during the peak hour.
- Feasibility less likely above 875 vphpd during the peak hour and expect reduced arterial LOS during the peak period.

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Maximum Total Volumes

Total Volumes

Traffic counts were taken on 8th Ave April 2016. These counts indicated that there are 12,251 vehicles per day on the north end of 8th Ave (south of 25th St) and 11,187 vehicles per day on the south end of 8th Ave (north of 28th St). Thus the total daily volume of approximately 12,000 vehicles per day is within the maximum recommended by FHWA.

Intersection Volumes

Peak hour turning movement volumes were obtained at each intersection along 8th Ave. The AM and PM volumes were entered into the computer program Synchro to determine the Level of Service (LOS) at each intersection.

LOS is a measurement of delay at an intersection and gives an indication of how the intersection is operating. LOS A represents little or no delay and LOS F represents severe congestion. Signalized intersections are measured with a single LOS while stop sign controlled intersections report a separate LOS for each approach. The goal is to have intersections operate at LOS C or LOS D.

The following table represents the existing LOS at each intersection along 8th Ave.

Intersection Direction	Existing	
	AM	PM
25th St & 8th Ave	A	B
26th St (N) & 8th Ave		
WB Left	B	C
WB Right	A	B
SB Left	A	A
26th St (S) & 8th Ave		
EB Left	B	D
EB Right	A	B
NB Left	A	A
27th St & 8th Ave		
WB Left & Right	B	B
SB Left	A	A
27th Pl & 8th Ave		
EB Left & Right	B	B
NB Left	A	A
27th St Rd & 8th Ave		
WB Left & Right	B	B
SB Left	A	A
28th St & 8th Ave		
EB Left, Thru & Right	B	B
WB Left, Thru & Right	B	C
NB Left	A	A
SB Left	A	A

Existing LOS

As the table indicates, all intersections are operating at LOS D or better.

The LOS analysis was then repeated with one less through lane in each direction to determine if there would be any changes to the LOS. The following table shows the LOS with one thru lane removed along with the existing LOS.

Intersection Direction	Existing		Minus One Lane	
	AM	PM	AM	PM
25th St & 8th Ave	A	B	B	B
26th St (N) & 8th Ave				
WB Left	B	C	B	E
WB Right	A	B	A	B
SB Left	A	A	A	A
26th St (S) & 8th Ave				
EB Left	B	D	B	E
EB Right	A	B	B	B
NB Left	A	A	A	A
27th St & 8th Ave				
WB Left & Right	B	B	B	C
SB Left	A	A	A	A
27th Pl & 8th Ave				
EB Left & Right	B	B	B	C
NB Left	A	A	A	A
27th St Rd & 8th Ave				
WB Left & Right	B	B	B	C
SB Left	A	A	A	A
28th St & 8th Ave				
EB Left, Thru & Right	B	B	B	C
WB Left, Thru & Right	B	C	B	D
NB Left	A	A	A	A
SB Left	A	A	A	A

LOS with One Lane Removed in Each Direction

As the above table indicates, most of the turn movements remain basically the same. However, the LOS for the WB left turns at 26th St increase from LOS C and D to LOS E. The WB direction at 28th St increases from LOS C to D.

The following table indicates the changes that are likely to occur by removing one lane in each direction on 8th Ave. The table shows the increase in delays and the increase in the queue lengths for the intersection of 26th St and the intersection of 28th St.

Intersection	Existing		Minus One Lane		Existing		Minus One Lane	
Direction	AM	PM	AM	PM	Delay	Queue	Delay	Queue
25th St & 8th Ave	A	B	B	B				
26th St (N) & 8th Ave								
WB Left	B	C	B	E	21.4 sec	33 ft 1-2 veh	38.9 sec	61 ft 2-3 veh
WB Right	A	B	A	B				
SB Left	A	A	A	A				
26th St (S) & 8th Ave								
EB Left	B	D	B	E	30.3 sec	60 ft 2-3 veh	42 sec	81 ft 3-4 veh
EB Right	A	B	B	B				
NB Left	A	A	A	A				
27th St & 8th Ave								
WB Left & Right	B	B	B	C				
SB Left	A	A	A	A				
27th Pl & 8th Ave								
EB Left & Right	B	B	B	C				
NB Left	A	A	A	A				
27th St Rd & 8th Ave								
WB Left & Right	B	B	B	C				
SB Left	A	A	A	A				
28th St & 8th Ave								
EB Left, Thru & Right	B	B	B	C				
WB Left, Thru & Right	B	C	B	D	20.5 Sec	2 ft < 1 veh	28 sec	3 ft <1 veh
NB Left	A	A	A	A				
SB Left	A	A	A	A				

Delay and Queue Length Changes

As the table indicates, the delays for the WB left turn on 26th St will likely increase from 21.4 seconds to 38.9 seconds. The queue length will increase from 1-2 vehicles to 2-3 vehicles. The delays for the EB left turn on 26th St will likely increase from 30.3 seconds to 42 seconds and the queue lengths will increase for 2-3 vehicles to 2-4 vehicles.

At the WB approach of 28th St, the delay will increase from 20.5 seconds to 28 seconds, but the queues are expected to be less than 1 vehicle. That means that the traffic volume is very low and if a vehicle shows up during the peak hour it will have 20 – 28 seconds of delay. With the low volumes on this approach, it is not a concern.

Conclusion

This study has shown that additional delays will occur at the 26th Ave WB and EB left turns if the street section is narrowed from 5 lanes to 3 lanes by removing a through lane. If this strategy is pursued, special attention needs to be given to these left turns.

Appendix

Traffic Counts
LOS Calculations

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge,CO 80033
www.alltrafficdata.net

Site Code: 8
Station ID: 8
8TH AVE S/O 25TH ST

Start Time	14-Apr-16 Thu	NB	SB							Total
12:00 AM		47	81							128
01:00		34	38							72
02:00		17	20							37
03:00		19	17							36
04:00		25	28							53
05:00		81	80							161
06:00		97	117							214
07:00		186	231							417
08:00		257	335							592
09:00		265	349							614
10:00		275	371							646
11:00		**370**	**473**							**843**
12:00 PM		424	**585**							**1009**
01:00		380	498							878
02:00		332	478							810
03:00		339	577							916
04:00		385	560							945
05:00		**439**	560							999
06:00		406	489							895
07:00		280	413							693
08:00		231	281							512
09:00		184	180							364
10:00		122	128							250
11:00		67	100							167
Total		5262	6989							12251
Percent		43.0%	57.0%							
AM Peak	-	11:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	370	473	-	-	-	-	-	-	843
PM Peak	-	17:00	12:00	-	-	-	-	-	-	12:00
Vol.	-	439	585	-	-	-	-	-	-	1009
Grand Total		5262	6989							12251
Percent		43.0%	57.0%							
ADT		ADT 12,251		AADT 12,251						

All Traffic Data Services, Inc
9660 W 44th Ave
Wheat Ridge,CO 80033
www.alltrafficdata.net

Site Code: 9
Station ID: 9
8TH AVE N/O 28TH ST

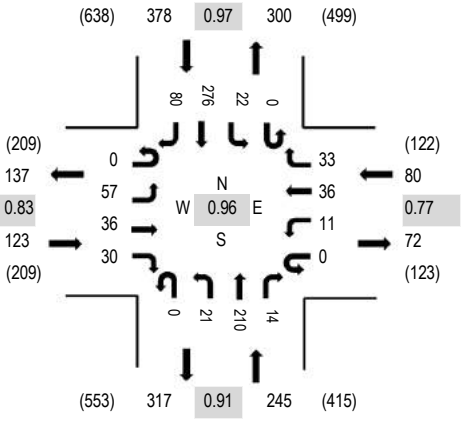
Start Time	14-Apr-16 Thu	NB	SB							Total
12:00 AM		22	72							94
01:00		17	42							59
02:00		7	27							34
03:00		14	22							36
04:00		14	35							49
05:00		61	80							141
06:00		72	125							197
07:00		166	186							352
08:00		246	325							571
09:00		231	407							638
10:00		270	434							704
11:00		**283**	**511**							**794**
12:00 PM		287	**599**							**886**
01:00		279	535							814
02:00		272	529							801
03:00		285	576							861
04:00		330	543							873
05:00		**357**	527							884
06:00		330	450							780
07:00		221	362							583
08:00		152	256							408
09:00		117	174							291
10:00		88	124							212
11:00		35	90							125
Total		4156	7031							11187
Percent		37.2%	62.8%							
AM Peak	-	11:00	11:00	-	-	-	-	-	-	11:00
Vol.	-	283	511	-	-	-	-	-	-	794
PM Peak	-	17:00	12:00	-	-	-	-	-	-	12:00
Vol.	-	357	599	-	-	-	-	-	-	886
Grand Total		4156	7031							11187
Percent		37.2%	62.8%							

ADT ADT 11,187 AADT 11,187

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

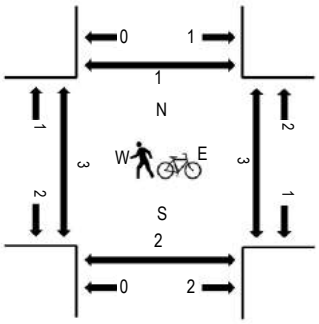
Location: 7 8TH AVE & 25TH ST AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



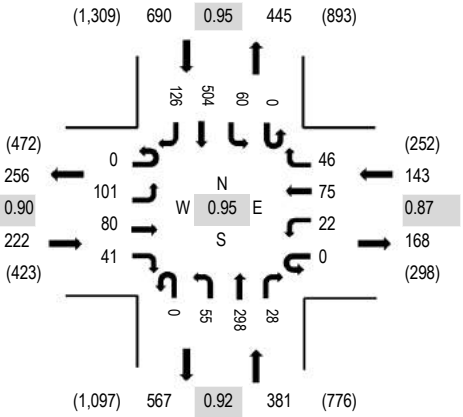
Traffic Counts

Interval Start Time	25TH ST Eastbound				25TH ST Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM	0	5	5	4	0	1	2	7	0	3	30	3	0	3	43	10	116	558	0	0	0	0
7:15:00 AM	0	13	3	8	0	2	3	3	0	2	29	3	0	4	38	6	114	642	0	0	0	0
7:30:00 AM	0	8	9	10	0	1	6	6	0	6	42	4	0	4	52	10	158	732	0	0	0	0
7:45:00 AM	0	11	5	5	0	1	4	6	0	5	39	4	0	4	71	15	170	782	1	3	2	2
8:00:00 AM	0	8	5	5	0	3	8	7	0	10	54	3	0	4	77	16	200	826	1	0	1	0
8:15:00 AM	0	12	10	9	0	3	10	13	0	5	43	3	0	6	67	23	204		2	3	1	1
8:30:00 AM	0	14	14	9	0	1	8	4	0	3	59	3	0	6	73	14	208		0	0	0	0
8:45:00 AM	0	23	7	7	0	4	10	9	0	3	54	5	0	6	59	27	214		0	0	0	0
Count Total	0	94	58	57	0	16	51	55	0	37	350	28	0	37	480	121	1,384		4	6	4	3
Peak Hour	0	57	36	30	0	11	36	33	0	21	210	14	0	22	276	80	826		1	3	2	2

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

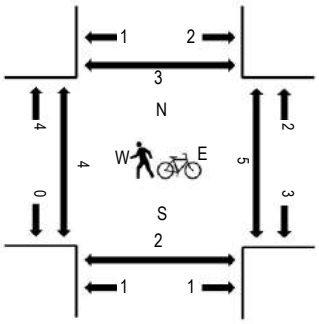
Location: 7 8TH AVE & 25TH ST PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



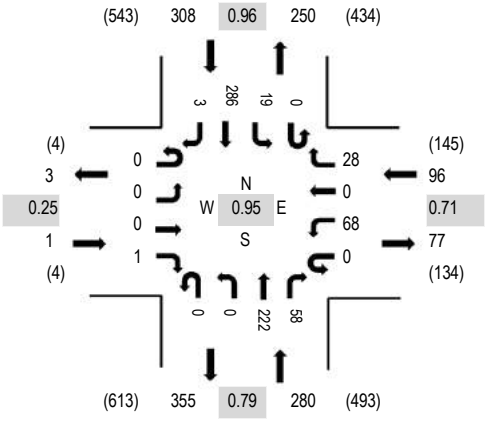
Traffic Counts

Interval Start Time	25TH ST Eastbound				25TH ST Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00:00 PM	0	25	21	9	0	2	19	4	0	19	74	4	0	11	105	20	313	1,346	1	0	0	2
4:15:00 PM	0	20	13	13	0	2	14	12	0	15	60	5	0	10	127	29	320	1,411	0	0	0	0
4:30:00 PM	0	24	19	10	0	6	21	14	0	11	78	9	0	13	134	34	373	1,436	1	1	0	1
4:45:00 PM	0	25	24	7	0	4	8	13	0	14	59	6	0	17	135	28	340	1,404	0	1	0	1
5:00:00 PM	0	30	22	10	0	7	23	7	0	16	77	7	0	19	128	32	378	1,414	1	1	0	1
5:15:00 PM	0	22	15	14	0	5	23	12	0	14	84	6	0	11	107	32	345		1	0	1	0
5:30:00 PM	0	23	19	6	0	8	9	6	0	14	90	6	0	3	131	26	341		1	0	0	0
5:45:00 PM	0	28	14	10	0	5	17	11	0	9	95	4	0	20	112	25	350		0	0	0	0
Count Total	0	197	147	79	0	39	134	79	0	112	617	47	0	104	979	226	2,760		5	3	1	5
Peak Hour	0	101	80	41	0	22	75	46	0	55	298	28	0	60	504	126	1,436		1	3	2	2

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

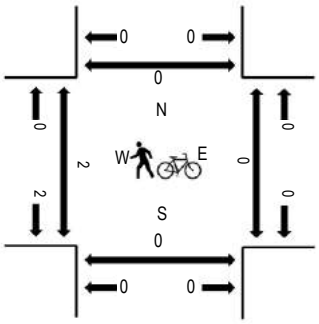
Location: 6 8TH AVE & 26TH ST (NORTH) AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



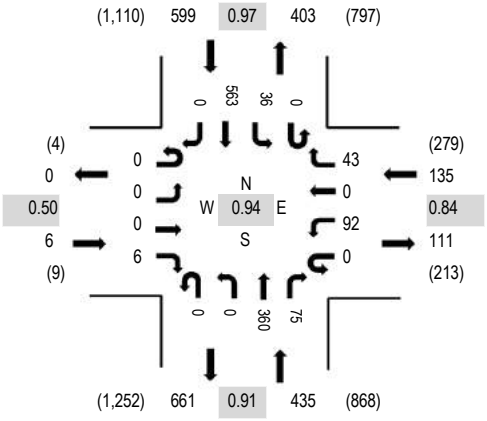
Traffic Counts

Interval Start Time	26TH ST (NORTH) Eastbound				26TH ST (NORTH) Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM	0	0	0	0	0	5	0	3	0	0	30	8	0	2	45	0	93	500	0	0	0	0
7:15:00 AM	0	0	1	0	0	5	0	4	0	0	38	12	0	2	43	0	105	577	0	0	0	0
7:30:00 AM	0	0	0	0	0	14	0	5	0	0	50	10	0	5	61	1	146	634	1	0	0	0
7:45:00 AM	0	0	0	2	0	10	0	3	0	0	51	14	0	3	73	0	156	669	1	0	0	0
8:00:00 AM	0	0	0	1	0	10	0	8	0	0	58	14	0	4	75	0	170	685	0	0	0	0
8:15:00 AM	0	0	0	0	0	24	0	10	0	0	37	11	0	3	74	3	162		1	0	0	0
8:30:00 AM	0	0	0	0	0	15	0	2	0	0	72	17	0	8	67	0	181		1	0	0	0
8:45:00 AM	0	0	0	0	0	19	0	8	0	0	55	16	0	4	70	0	172		0	0	0	0
Count Total	0	0	1	3	0	102	0	43	0	0	391	102	0	31	508	4	1,185		4	0	0	0
Peak Hour	0	0	0	1	0	68	0	28	0	0	222	58	0	19	286	3	685		2	0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

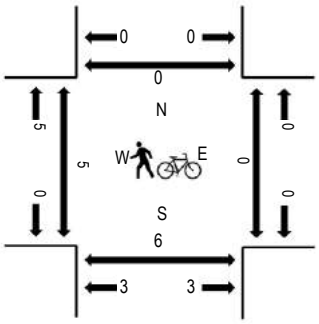
Location: 6 8TH AVE & 26TH ST (NORTH) PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



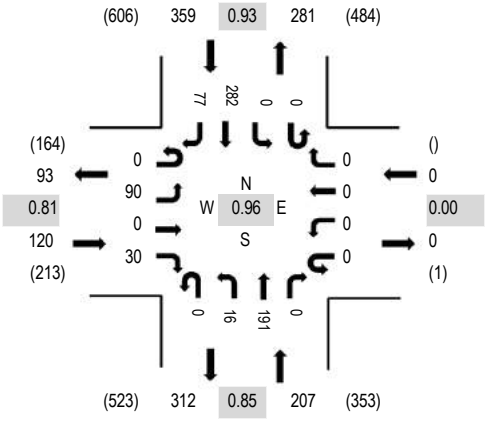
Traffic Counts

Interval Start Time	26TH ST (NORTH) Eastbound				26TH ST (NORTH) Westbound				8TH AVE Northbound				8TH AVE Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00:00 PM	0	0	0	1	0	32	0	13	0	0	77	18	0	6	115	0	262	1,109	1	0	1	0
4:15:00 PM	0	0	0	0	0	22	0	9	0	0	82	17	0	6	136	0	272	1,159	0	0	1	0
4:30:00 PM	0	0	0	0	0	23	0	7	1	2	93	20	0	6	137	2	291	1,172	1	1	2	0
4:45:00 PM	0	0	0	2	0	25	0	15	0	0	75	12	0	4	151	0	284	1,175	0	0	0	0
5:00:00 PM	0	0	0	3	0	26	0	11	0	0	90	28	0	7	147	0	312	1,157	2	0	0	0
5:15:00 PM	0	0	0	1	0	20	0	9	0	0	101	19	0	15	120	0	285		0	0	4	0
5:30:00 PM	0	0	0	0	0	21	0	8	0	0	94	16	0	10	145	0	294		1	0	2	0
5:45:00 PM	0	0	0	2	0	26	0	12	0	0	101	22	0	7	96	0	266		0	0	0	0
Count Total	0	0	0	9	0	195	0	84	1	2	713	152	0	61	1,047	2	2,266		5	1	10	0
Peak Hour	0	0	0	6	0	92	0	43	0	0	360	75	0	36	563	0	1,175		2	0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

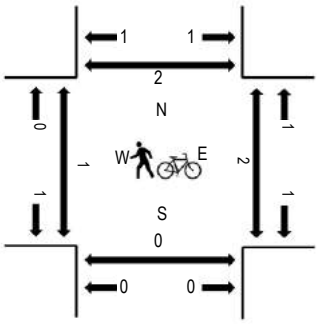
Location: 5 8TH AVE & 26TH ST (SOUTH) AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:45 AM - 09:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



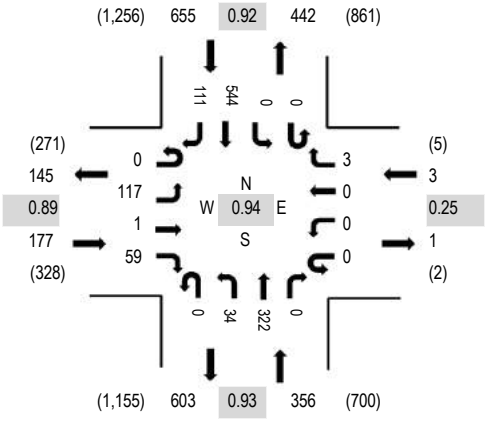
Traffic Counts

Interval Start Time	26TH ST (SOUTH) Eastbound				26TH ST (SOUTH) Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM	0	21	0	1	0	0	0	0	0	3	20	0	0	0	44	7	96	486	1	1	0	1
7:15:00 AM	0	15	0	3	0	0	0	0	0	3	26	0	0	0	32	10	89	565	0	0	0	0
7:30:00 AM	0	21	1	5	0	0	0	0	0	9	37	0	0	0	57	15	145	634	0	0	0	0
7:45:00 AM	1	18	0	7	0	0	0	0	0	3	45	0	0	0	62	20	156	663	2	0	0	0
8:00:00 AM	0	23	0	3	0	0	0	0	0	7	54	0	0	0	72	16	175	686	0	0	0	0
8:15:00 AM	0	17	0	7	0	0	0	0	0	3	35	0	0	0	75	21	158		1	0	0	0
8:30:00 AM	0	27	0	6	0	0	0	0	0	1	52	0	0	0	71	17	174		0	1	0	0
8:45:00 AM	0	23	0	14	0	0	0	0	0	5	50	0	0	0	64	23	179		0	1	0	2
Count Total	1	165	1	46	0	0	0	0	0	34	319	0	0	0	477	129	1,172		4	3	0	3
Peak Hour	0	90	0	30	0	0	0	0	0	16	191	0	0	0	282	77	686		3	1	0	1

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

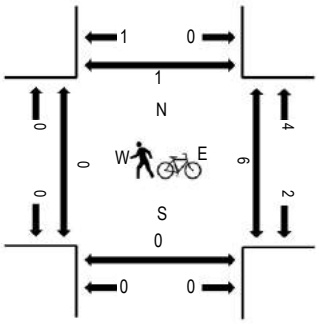
Location: 5 8TH AVE & 26TH ST (SOUTH) PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



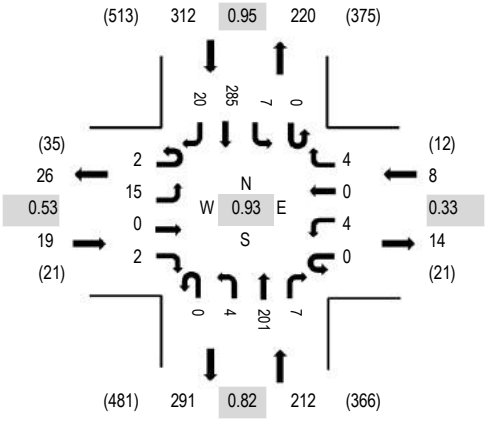
Traffic Counts

Interval Start Time	26TH ST (SOUTH) Eastbound				26TH ST (SOUTH) Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00:00 PM	0	17	0	12	0	2	0	0	0	7	84	0	0	0	118	15	255	1,116	0	1	1	0
4:15:00 PM	0	28	0	11	0	0	0	0	0	11	60	0	0	0	141	26	277	1,179	0	2	0	0
4:30:00 PM	0	25	0	12	0	0	0	0	0	8	88	0	0	0	130	31	294	1,191	0	1	0	0
4:45:00 PM	0	24	1	20	0	0	0	0	0	12	63	0	0	0	140	30	290	1,181	0	2	0	0
5:00:00 PM	0	28	0	17	0	0	0	3	0	6	86	0	0	0	150	28	318	1,173	0	0	0	0
5:15:00 PM	0	40	0	10	0	0	0	0	0	8	85	0	0	0	124	22	289		0	1	0	1
5:30:00 PM	0	37	0	9	0	0	0	0	0	7	76	0	0	0	131	24	284		0	1	0	2
5:45:00 PM	0	25	0	12	0	0	0	0	0	7	92	0	0	1	116	29	282		0	0	0	0
Count Total	0	224	1	103	0	2	0	3	0	66	634	0	0	1	1,050	205	2,289		0	8	1	3
Peak Hour	0	117	1	59	0	0	0	3	0	34	322	0	0	0	544	111	1,191		3	1	0	1

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

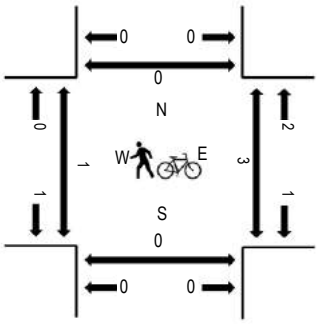
Location: 4 8TH AVE & 27TH ST AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



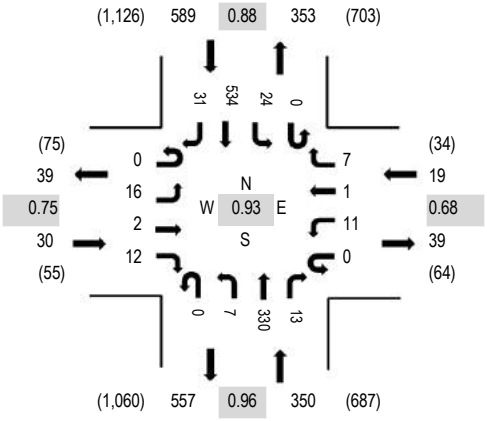
Traffic Counts

Interval Start Time	27TH ST Eastbound				27TH ST Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM	0	0	0	0	0	0	0	2	0	0	21	1	0	3	38	0	65	361	1	0	0	0
7:15:00 AM	0	1	0	0	0	0	0	1	0	1	32	0	0	0	35	0	70	444	0	0	0	1
7:30:00 AM	0	0	0	0	0	0	0	1	0	1	47	0	1	3	49	1	103	490	0	0	0	0
7:45:00 AM	1	0	0	0	0	0	0	0	0	2	49	0	0	0	68	3	123	528	0	0	0	0
8:00:00 AM	1	3	0	0	0	1	0	1	0	0	61	4	0	1	73	3	148	551	0	0	0	0
8:15:00 AM	0	0	0	2	0	0	0	0	0	1	39	0	0	0	70	4	116		1	0	0	0
8:30:00 AM	0	4	0	0	0	0	0	0	0	2	51	2	0	3	71	8	141		0	1	0	0
8:45:00 AM	1	8	0	0	0	3	0	3	0	1	50	1	0	3	71	5	146		0	2	0	0
Count Total	3	16	0	2	0	4	0	8	0	8	350	8	1	13	475	24	912		2	3	0	1
Peak Hour	2	15	0	2	0	4	0	4	0	4	201	7	0	7	285	20	551		1	0	0	1

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

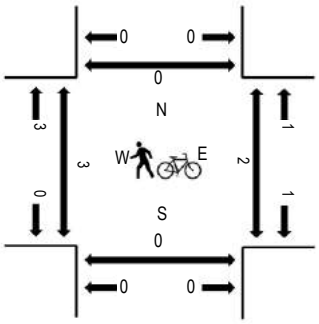
Location: 4 8TH AVE & 27TH ST PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



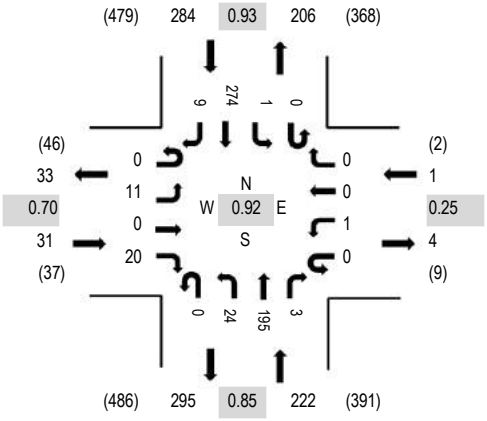
Traffic Counts

Interval Start Time	27TH ST Eastbound				27TH ST Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00:00 PM	0	4	0	2	0	2	0	3	0	0	86	3	0	2	123	6	231	936	1	0	0	0
4:15:00 PM	0	5	0	0	0	0	0	3	0	0	60	1	0	2	135	13	219	971	0	0	1	0
4:30:00 PM	0	7	2	1	0	5	1	1	0	2	87	1	0	5	127	8	247	988	0	1	0	0
4:45:00 PM	0	2	0	4	0	1	0	1	0	3	72	4	0	5	136	11	239	979	0	0	0	0
5:00:00 PM	0	1	0	5	0	2	0	1	0	0	86	4	0	11	150	6	266	966	1	0	0	0
5:15:00 PM	0	6	0	2	0	3	0	4	0	2	85	4	0	3	121	6	236		2	1	0	0
5:30:00 PM	1	4	0	1	0	1	0	3	0	2	81	5	0	6	126	8	238		2	0	0	0
5:45:00 PM	0	4	0	4	0	1	0	2	0	0	95	4	0	2	108	6	226		2	0	1	0
Count Total	1	33	2	19	0	15	1	18	0	9	652	26	0	36	1,026	64	1,902		8	2	2	0
Peak Hour	0	16	2	12	0	11	1	7	0	7	330	13	0	24	534	31	988		1	0	0	1

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

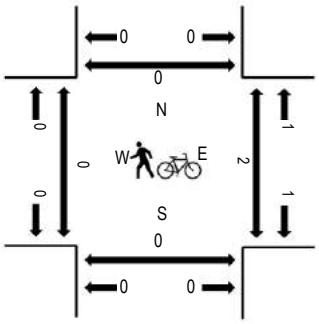
Location: 3 8TH AVE & Westbound Approach AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



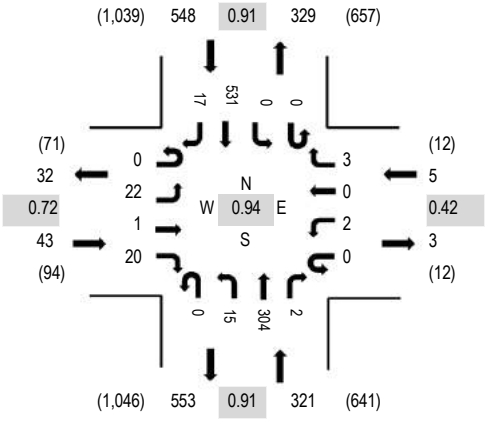
Traffic Counts

Interval Start Time	27TH ST PL Eastbound				Westbound Approach Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM	0	1	0	0	0	0	0	0	0	1	23	0	0	0	38	0	63	371	1	0	0	0
7:15:00 AM	0	1	0	0	0	0	0	0	0	4	32	0	0	0	34	3	74	454	0	0	0	0
7:30:00 AM	0	1	0	1	0	0	0	0	0	2	51	0	0	0	53	2	110	497	0	0	0	0
7:45:00 AM	0	0	0	2	0	0	0	1	0	1	52	3	0	2	63	0	124	520	0	0	0	0
8:00:00 AM	0	2	0	2	0	1	0	0	0	4	60	1	0	0	74	2	146	538	0	0	0	0
8:15:00 AM	0	1	0	4	0	0	0	0	0	3	36	1	0	1	68	3	117		0	0	0	0
8:30:00 AM	0	4	0	7	0	0	0	0	0	5	51	1	0	0	62	3	133		0	1	0	0
8:45:00 AM	0	4	0	7	0	0	0	0	0	12	48	0	0	0	70	1	142		0	1	0	0
Count Total	0	14	0	23	0	1	0	1	0	32	353	6	0	3	462	14	909		1	2	0	0
Peak Hour	0	11	0	20	0	1	0	0	0	24	195	3	0	1	274	9	538		1	0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

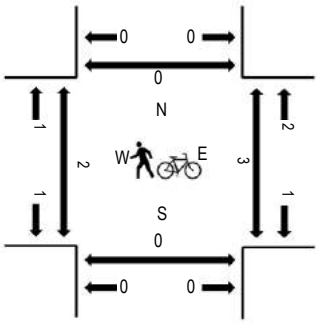
Location: 3 8TH AVE & Westbound Approach PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



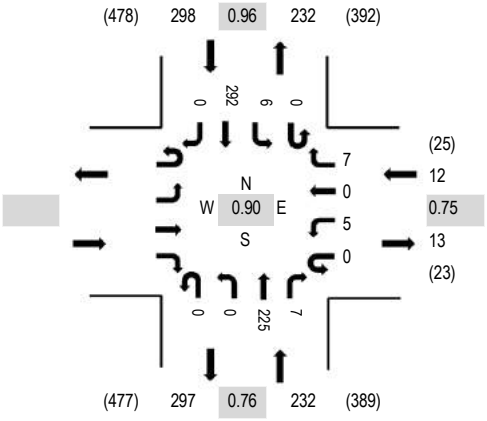
Traffic Counts

Interval Start Time	27TH ST PL Eastbound				Westbound Approach Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00:00 PM	0	8	1	8	0	0	0	0	0	7	80	1	0	1	119	5	230	883	0	1	0	0
4:15:00 PM	0	4	0	2	0	1	0	0	0	4	59	0	0	2	121	4	197	896	0	0	0	0
4:30:00 PM	0	6	0	4	0	0	0	0	0	5	82	1	0	0	127	5	230	917	0	2	0	0
4:45:00 PM	0	8	0	7	0	1	0	1	0	0	65	1	0	0	133	10	226	915	0	0	0	0
5:00:00 PM	0	3	0	4	0	1	0	2	0	3	79	0	0	0	149	2	243	903	0	1	0	0
5:15:00 PM	0	5	1	5	0	0	0	0	0	7	78	0	0	0	122	0	218		2	0	0	0
5:30:00 PM	0	7	0	6	0	2	0	2	0	4	71	2	0	0	128	6	228		0	1	0	0
5:45:00 PM	0	8	0	7	0	0	0	2	0	3	87	2	0	0	99	6	214		0	3	0	0
Count Total	0	49	2	43	0	5	0	7	0	33	601	7	0	3	998	38	1,786		2	8	0	0
Peak Hour	0	22	1	20	0	2	0	3	0	15	304	2	0	0	531	17	917		1	0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

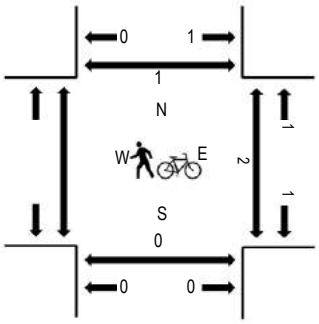
Location: 2 8TH AVE & 27TH ST RD AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



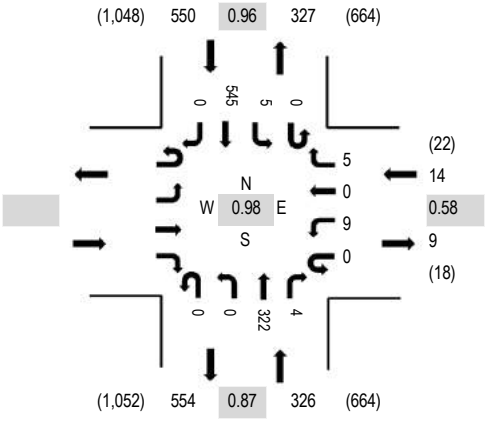
Traffic Counts

Interval Start Time	Eastbound				27TH ST RD Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM					0	2	0	2	0	0	19	1	0	0	39	0	63	350		0	0	0
7:15:00 AM					0	1	0	1	0	0	36	1	0	0	30	0	69	438		0	0	0
7:30:00 AM					0	1	0	3	0	0	46	0	0	1	50	0	101	486		0	0	0
7:45:00 AM					0	1	0	2	0	0	51	3	0	4	56	0	117	524		0	0	0
8:00:00 AM					0	0	0	2	0	0	76	0	0	2	71	0	151	542		0	0	0
8:15:00 AM					0	0	0	2	0	0	40	4	0	1	70	0	117			0	0	0
8:30:00 AM					0	3	0	1	0	0	55	2	0	0	78	0	139			1	0	0
8:45:00 AM					0	2	0	2	0	0	54	1	0	3	73	0	135			1	0	1
Count Total					0	10	0	15	0	0	377	12	0	11	467	0	892			2	0	1
Peak Hour					0	5	0	7	0	0	225	7	0	6	292	0	542			0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

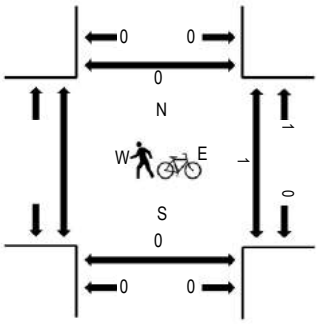
Location: 2 8TH AVE & 27TH ST RD PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



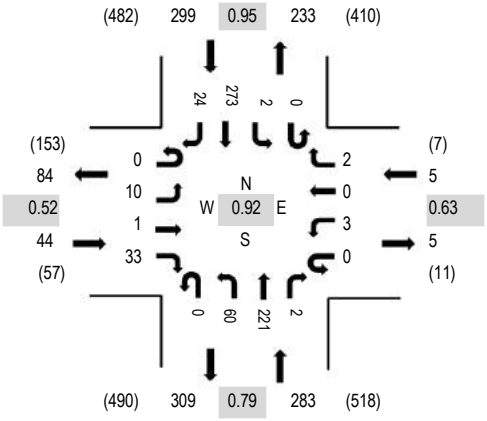
Traffic Counts

Interval Start Time	Eastbound U-Turn	Eastbound Left	Eastbound Thru	Eastbound Right	27TH ST RD Westbound U-Turn	Westbound Left	Westbound Thru	Westbound Right	8TH AVE Northbound U-Turn	Northbound Left	Northbound Thru	Northbound Right	8TH AVE Southbound U-Turn	Southbound Left	Southbound Thru	Southbound Right	Total	Rolling Hour	Pedestrain Crossings West	East	South	North
4:00:00 PM					0	0	0	2	0	0	89	2	0	0	140	0	233	858		0	0	0
4:15:00 PM					0	3	0	0	0	0	63	1	0	0	120	0	187	850		0	0	0
4:30:00 PM					0	1	0	0	0	0	92	2	0	1	126	0	222	890		1	0	0
4:45:00 PM					0	5	0	0	0	0	73	1	0	1	136	0	216	883		0	0	0
5:00:00 PM					0	2	0	4	0	0	75	1	0	1	142	0	225	876		0	0	0
5:15:00 PM					0	1	0	1	0	0	82	0	0	2	141	0	227			0	0	0
5:30:00 PM					0	0	0	2	0	0	83	1	0	0	129	0	215			0	0	0
5:45:00 PM					0	1	0	0	0	0	98	1	0	4	105	0	209			1	0	0
Count Total					0	13	0	9	0	0	655	9	0	9	1,039	0	1,734			2	0	0
Peak Hour					0	9	0	5	0	0	322	4	0	5	545	0	890			0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

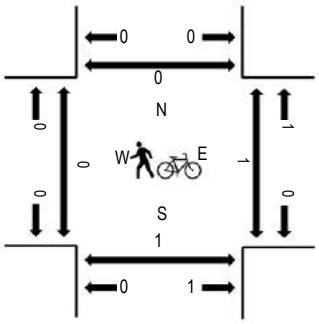
Location: 1 8TH AVE & 28TH ST AM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 08:00 AM - 09:00 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



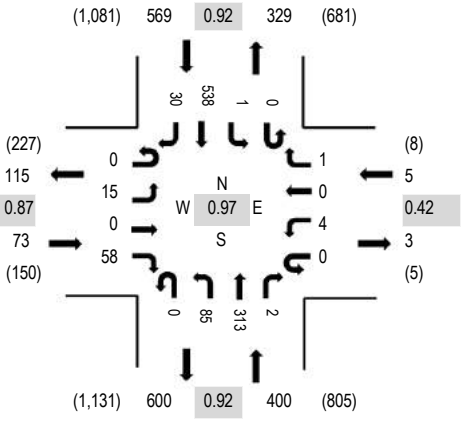
Traffic Counts

Interval Start Time	28TH ST Eastbound				28TH ST Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00:00 AM	0	1	0	0	0	0	0	0	0	10	20	0	0	0	37	3	71	433	0	0	0	0
7:15:00 AM	0	0	0	0	0	0	0	0	0	13	38	1	0	0	31	0	83	533	0	0	0	0
7:30:00 AM	0	1	1	4	0	0	0	1	0	17	48	1	0	1	50	3	127	592	0	0	0	0
7:45:00 AM	0	0	0	6	0	0	0	1	0	18	67	2	0	0	53	5	152	619	0	0	0	1
8:00:00 AM	0	2	0	2	0	1	0	0	0	24	66	0	0	1	71	4	171	631	0	0	0	0
8:15:00 AM	0	3	1	6	0	0	0	1	0	13	38	1	0	0	71	8	142		0	0	0	0
8:30:00 AM	0	2	0	7	0	2	0	0	0	11	65	1	0	0	62	4	154		0	1	1	0
8:45:00 AM	0	3	0	18	0	0	0	1	0	12	52	0	0	1	69	8	164		0	0	0	0
Count Total	0	12	2	43	0	3	0	4	0	118	394	6	0	3	444	35	1,064		0	1	1	1
Peak Hour	0	10	1	33	0	3	0	2	0	60	221	2	0	2	273	24	631		0	0	0	1

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

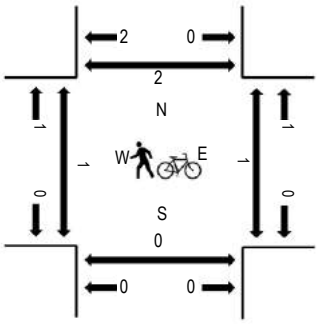
Location: 1 8TH AVE & 28TH ST PM
Date and Start Time: Thursday, April 14, 2016
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	28TH ST Eastbound				28TH ST Westbound				8TH AVE Northbound				8TH AVE Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00:00 PM	0	3	0	12	0	0	0	0	0	23	85	0	0	1	116	11	251	1,009	0	0	0	0
4:15:00 PM	0	4	0	20	0	0	0	2	0	12	71	0	0	0	131	11	251	1,027	0	0	0	0
4:30:00 PM	0	4	0	12	0	0	0	0	0	21	83	0	0	0	126	4	250	1,047	0	1	0	2
4:45:00 PM	0	1	0	17	0	0	0	0	0	24	68	1	0	0	135	11	257	1,047	0	0	0	0
5:00:00 PM	0	4	0	14	0	2	0	1	0	17	76	1	0	0	147	7	269	1,035	0	0	0	0
5:15:00 PM	0	6	0	15	0	2	0	0	0	23	86	0	0	1	130	8	271		1	0	0	0
5:30:00 PM	0	6	1	18	0	0	0	0	0	20	74	0	0	0	122	9	250		1	0	0	0
5:45:00 PM	0	5	0	8	0	1	0	0	0	18	102	0	0	0	103	8	245		0	1	0	0
Count Total	0	33	1	116	0	5	0	3	0	158	645	2	0	2	1,010	69	2,044		2	2	0	2
Peak Hour	0	15	0	58	0	4	0	1	0	85	313	2	0	1	538	30	1,047		0	0	0	1

The following information can be found in the Highway Capacity Manual, Transportation Research Board, 2000: Chapter 10 – Urban Streets Concepts Signalized Intersections and Chapter 17 – Unsignalized Intersections.

Level Of Service (LOS) for Signalized Intersections

Levels of service are defined to represent reasonable ranges in control delay.

LOS A

Describes operations with low control delay, up to 10 s/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

LOS B

Describes operations with control delay greater then 10 and up to 20 s/veh. This level generally occurs with good progressions, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

LOS C

Describes operations with control delay greater than 20 and up to 35 s/veh. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at the level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D

Describes operations with control delay greater than 35 and up to 55 s/veh. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

LOS E

Describes operations with control delay greater than 55 and up to 80 s/veh. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

LOS F

Describes operations with control delay in excess of 80 s/veh. This level, considered unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

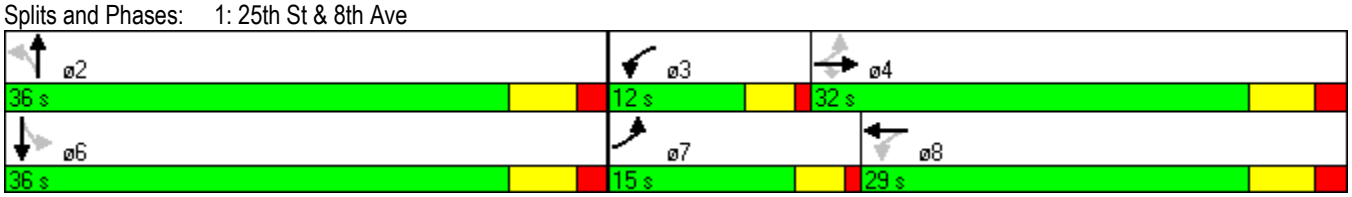
Level of Service (LOS) for Unsignalized TWSC Intersections

Level of Service	Average Control Delay (s/veh)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	36	30	11	36	33	21	210	14	22	276	80
Satd. Flow (prot)	1770	1863	1583	1770	1729	0	1770	3507	0	1770	3419	0
Flt Permitted	0.452			0.732			0.523			0.601		
Satd. Flow (perm)	842	1863	1583	1364	1729	0	974	3507	0	1120	3419	0
Satd. Flow (RTOR)			33		36			10			54	
Lane Group Flow (vph)	62	39	33	12	75	0	23	243	0	24	387	0
Turn Type	pm+pt		Perm	pm+pt			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	15.0	32.0	32.0	12.0	29.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)	14.8	11.9	11.9	11.4	7.0		39.8	39.8		39.8	39.8	
Actuated g/C Ratio	0.26	0.21	0.21	0.20	0.12		0.69	0.69		0.69	0.69	
v/c Ratio	0.19	0.10	0.09	0.04	0.31		0.03	0.10		0.03	0.16	
Control Delay	15.3	19.2	8.9	13.5	18.8		9.1	7.2		9.0	6.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.3	19.2	8.9	13.5	18.8		9.1	7.2		9.0	6.6	
LOS	B	B	A	B	B		A	A		A	A	
Approach Delay		14.8			18.0			7.4			6.8	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)	15	10	0	3	13		4	22		4	32	
Queue Length 95th (ft)	37	36	20	12	47		16	44		16	62	
Internal Link Dist (ft)		465			467			420			110	
Turn Bay Length (ft)	100		200	100			100			100		
Base Capacity (vph)	431	848	738	379	718		672	2422		772	2375	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.05	0.04	0.03	0.10		0.03	0.10		0.03	0.16	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 57.7	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.31	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 38.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: 25th St & 8th Ave



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	68	28	222	58	19	266
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	30	241	63	21	289
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			177			500
pX, platoon unblocked						
vC, conflicting volume	459	152			304	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	459	152			304	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	96			98	
cM capacity (veh/h)	522	867			1253	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	74	30	161	143	21	145	145
Volume Left	74	0	0	0	21	0	0
Volume Right	0	30	0	63	0	0	0
cSH	522	867	1700	1700	1253	1700	1700
Volume to Capacity	0.14	0.04	0.09	0.08	0.02	0.09	0.09
Queue Length 95th (ft)	12	3	0	0	1	0	0
Control Delay (s)	13.0	9.3	0.0	0.0	7.9	0.0	0.0
Lane LOS	B	A			A		
Approach Delay (s)	11.9		0.0		0.5		
Approach LOS	B						

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	90	30	16	191	282	77
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	33	17	208	307	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				303	677	
pX, platoon unblocked						
vC, conflicting volume	487	195	390			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	487	195	390			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	96	99			
cM capacity (veh/h)	502	813	1165			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	98	33	17	104	104	204	186
Volume Left	98	0	17	0	0	0	0
Volume Right	0	33	0	0	0	0	84
cSH	502	813	1165	1700	1700	1700	1700
Volume to Capacity	0.19	0.04	0.01	0.06	0.06	0.12	0.11
Queue Length 95th (ft)	18	3	1	0	0	0	0
Control Delay (s)	13.9	9.6	8.1	0.0	0.0	0.0	0.0
Lane LOS	B	A	A				
Approach Delay (s)	12.8		0.6			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	2	201	7	7	285
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	2	218	8	8	310
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						980
pX, platoon unblocked						
vC, conflicting volume	392	113			226	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	392	113			226	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	581	918			1340	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	18	146	80	8	155	155
Volume Left	16	0	0	8	0	0
Volume Right	2	0	8	0	0	0
cSH	607	1700	1700	1340	1700	1700
Volume to Capacity	0.03	0.09	0.05	0.01	0.09	0.09
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	11.1	0.0	0.0	7.7	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.1	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	20	24	195	274	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	22	26	212	298	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	461	154	308			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	461	154	308			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	98			
cM capacity (veh/h)	518	865	1250			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	34	26	106	106	199	109
Volume Left	12	26	0	0	0	0
Volume Right	22	0	0	0	0	10
cSH	699	1250	1700	1700	1700	1700
Volume to Capacity	0.05	0.02	0.06	0.06	0.12	0.06
Queue Length 95th (ft)	4	2	0	0	0	0
Control Delay (s)	10.4	7.9	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	10.4	0.9			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	7	225	7	6	292
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	8	245	8	7	317
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						80
pX, platoon unblocked						
vC, conflicting volume	420	126			252	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	420	126			252	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	559	901			1310	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	13	163	89	7	159	159
Volume Left	5	0	0	7	0	0
Volume Right	8	0	8	0	0	0
cSH	718	1700	1700	1310	1700	1700
Volume to Capacity	0.02	0.10	0.05	0.00	0.09	0.09
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	7.8	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.1	0.0		0.2		
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	1	33	3	0	2	60	221	2	2	273	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	1	36	3	0	2	65	240	2	2	297	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											475	
pX, platoon unblocked												
vC, conflicting volume	567	687	161	561	699	121	323			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	567	687	161	561	699	121	323			242		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	96	99	100	100	95			100		
cM capacity (veh/h)	389	348	855	376	343	907	1234			1321		

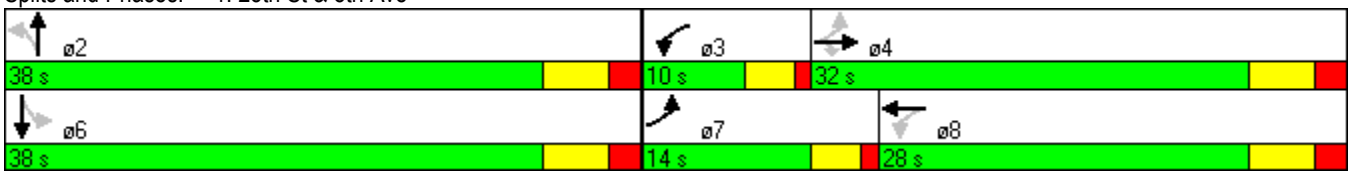
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	48	5	65	160	82	2	198	125
Volume Left	11	3	65	0	0	2	0	0
Volume Right	36	2	0	0	2	0	0	26
cSH	655	491	1234	1700	1700	1321	1700	1700
Volume to Capacity	0.07	0.01	0.05	0.09	0.05	0.00	0.12	0.07
Queue Length 95th (ft)	6	1	4	0	0	0	0	0
Control Delay (s)	10.9	12.4	8.1	0.0	0.0	7.7	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	10.9	12.4	1.7			0.1		
Approach LOS	B	B						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	80	41	22	75	46	56	298	28	60	504	80
Satd. Flow (prot)	1770	1863	1583	1770	1757	0	1770	3493	0	1770	3465	0
Flt Permitted	0.467			0.701			0.396			0.540		
Satd. Flow (perm)	870	1863	1583	1306	1757	0	738	3493	0	1006	3465	0
Satd. Flow (RTOR)			45		38			14			26	
Lane Group Flow (vph)	110	87	45	24	132	0	61	354	0	65	635	0
Turn Type	pm+pt		Perm	pm+pt			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	14.0	32.0	32.0	10.0	28.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)	20.6	15.3	15.3	15.0	8.9		37.4	37.4		37.4	37.4	
Actuated g/C Ratio	0.32	0.24	0.24	0.23	0.14		0.58	0.58		0.58	0.58	
v/c Ratio	0.28	0.20	0.11	0.07	0.48		0.14	0.17		0.11	0.31	
Control Delay	15.9	21.4	8.3	14.0	25.6		12.0	9.6		11.2	10.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.9	21.4	8.3	14.0	25.6		12.0	9.6		11.2	10.4	
LOS	B	C	A	B	C		B	A		B	B	
Approach Delay		16.5			23.8			10.0			10.5	
Approach LOS		B			C			A			B	
Queue Length 50th (ft)	29	24	0	6	35		13	38		13	75	
Queue Length 95th (ft)	60	65	23	19	82		39	71		38	128	
Internal Link Dist (ft)		465			467			420			110	
Turn Bay Length (ft)	100		200	100			100			100		
Base Capacity (vph)	434	762	674	352	633		430	2040		586	2029	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.25	0.11	0.07	0.07	0.21		0.14	0.17		0.11	0.31	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 64.3	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 50.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: 25th St & 8th Ave



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	92	43	360	75	36	563
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	47	391	82	39	612
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			177			500
pX, platoon unblocked	0.98					
vC, conflicting volume	816	236			473	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	770	236			473	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	94			96	
cM capacity (veh/h)	318	765			1085	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	100	47	261	212	39	306	306
Volume Left	100	0	0	0	39	0	0
Volume Right	0	47	0	82	0	0	0
cSH	318	765	1700	1700	1085	1700	1700
Volume to Capacity	0.31	0.06	0.15	0.12	0.04	0.18	0.18
Queue Length 95th (ft)	33	5	0	0	3	0	0
Control Delay (s)	21.4	10.0	0.0	0.0	8.4	0.0	0.0
Lane LOS	C	B			A		
Approach Delay (s)	17.8		0.0		0.5		
Approach LOS	C						

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	117	59	34	322	544	111
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	64	37	350	591	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				303	677	
pX, platoon unblocked						
vC, conflicting volume	901	356	712			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	901	356	712			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	52	90	96			
cM capacity (veh/h)	266	640	884			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	127	64	37	175	175	394	318
Volume Left	127	0	37	0	0	0	0
Volume Right	0	64	0	0	0	0	121
cSH	266	640	884	1700	1700	1700	1700
Volume to Capacity	0.48	0.10	0.04	0.10	0.10	0.23	0.19
Queue Length 95th (ft)	60	8	3	0	0	0	0
Control Delay (s)	30.3	11.2	9.3	0.0	0.0	0.0	0.0
Lane LOS	D	B	A				
Approach Delay (s)	23.9		0.9			0.0	
Approach LOS	C						

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	12	330	13	24	534
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	13	359	14	26	580
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						980
pX, platoon unblocked						
vC, conflicting volume	708	186			373	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	708	186			373	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	98			98	
cM capacity (veh/h)	361	824			1182	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	30	239	134	26	290	290
Volume Left	17	0	0	26	0	0
Volume Right	13	0	14	0	0	0
cSH	475	1700	1700	1182	1700	1700
Volume to Capacity	0.06	0.14	0.08	0.02	0.17	0.17
Queue Length 95th (ft)	5	0	0	2	0	0
Control Delay (s)	13.1	0.0	0.0	8.1	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	13.1	0.0		0.3		
Approach LOS	B					

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	22	20	15	304	531	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	22	16	330	577	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	784	298	596			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784	298	596			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	97	98			
cM capacity (veh/h)	325	698	977			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	46	16	165	165	385	211
Volume Left	24	16	0	0	0	0
Volume Right	22	0	0	0	0	18
cSH	436	977	1700	1700	1700	1700
Volume to Capacity	0.10	0.02	0.10	0.10	0.23	0.12
Queue Length 95th (ft)	9	1	0	0	0	0
Control Delay (s)	14.2	8.7	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.2	0.4			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	5	322	4	5	545
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	350	4	5	592
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						80
pX, platoon unblocked						
vC, conflicting volume	659	177			354	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	659	177			354	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	395	835			1201	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	15	233	121	5	296	296
Volume Left	10	0	0	5	0	0
Volume Right	5	0	4	0	0	0
cSH	486	1700	1700	1201	1700	1700
Volume to Capacity	0.03	0.14	0.07	0.00	0.17	0.17
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	12.6	0.0	0.0	8.0	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	12.6	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	58	4	0	1	85	313	2	1	538	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	63	4	0	1	92	340	2	1	585	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											475	
pX, platoon unblocked												
vC, conflicting volume	959	1130	309	884	1146	171	617			342		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	959	1130	309	884	1146	171	617			342		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	91	98	100	100	90			100		
cM capacity (veh/h)	195	183	687	202	179	843	959			1213		

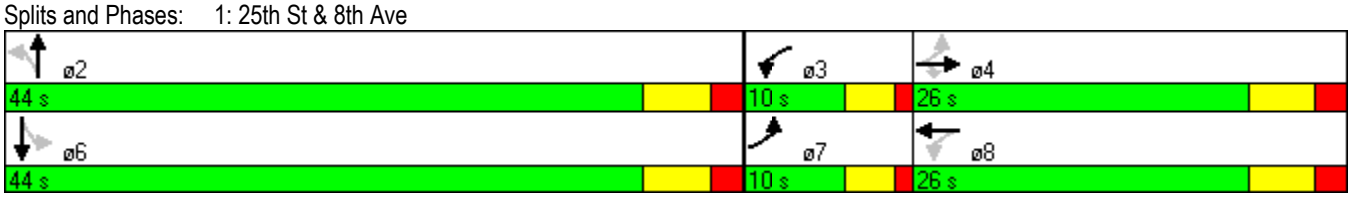
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	79	5	92	227	116	1	390	228
Volume Left	16	4	92	0	0	1	0	0
Volume Right	63	1	0	0	2	0	0	33
cSH	453	238	959	1700	1700	1213	1700	1700
Volume to Capacity	0.18	0.02	0.10	0.13	0.07	0.00	0.23	0.13
Queue Length 95th (ft)	16	2	8	0	0	0	0	0
Control Delay (s)	14.6	20.5	9.2	0.0	0.0	8.0	0.0	0.0
Lane LOS	B	C	A			A		
Approach Delay (s)	14.6	20.5	1.9			0.0		
Approach LOS	B	C						

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	36	30	11	36	33	21	210	14	22	276	80
Satd. Flow (prot)	1770	1863	1583	1770	1729	0	1770	1846	0	1770	1799	0
Flt Permitted	0.537			0.732			0.516			0.608		
Satd. Flow (perm)	1000	1863	1583	1364	1729	0	961	1846	0	1133	1799	0
Satd. Flow (RTOR)			33		36			6			25	
Lane Group Flow (vph)	62	39	33	12	75	0	23	243	0	24	387	0
Turn Type	pm+pt		Perm	pm+pt			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	10.0	26.0	26.0	10.0	26.0	0.0	44.0	44.0	0.0	44.0	44.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)	13.8	11.1	11.1	12.2	7.2		44.5	44.5		44.5	44.5	
Actuated g/C Ratio	0.21	0.17	0.17	0.19	0.11		0.68	0.68		0.68	0.68	
v/c Ratio	0.22	0.12	0.11	0.04	0.34		0.04	0.19		0.03	0.32	
Control Delay	20.4	24.0	10.7	17.5	21.2		7.2	7.0		7.1	7.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.4	24.0	10.7	17.5	21.2		7.2	7.0		7.1	7.6	
LOS	C	C	B	B	C		A	A		A	A	
Approach Delay		19.1			20.7			7.0			7.6	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)	19	12	0	4	15		4	43		4	72	
Queue Length 95th (ft)	44	41	23	14	50		14	86		14	137	
Internal Link Dist (ft)		465			467			420			110	
Turn Bay Length (ft)	100		200	100			100			100		
Base Capacity (vph)	283	570	507	294	554		651	1253		768	1228	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.22	0.07	0.07	0.04	0.14		0.04	0.19		0.03	0.32	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 65.6	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.34	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 39.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: 25th St & 8th Ave



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	68	28	222	58	19	266
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	30	241	63	21	289
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						500
pX, platoon unblocked						
vC, conflicting volume	603	273			304	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	603	273			304	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	96			98	
cM capacity (veh/h)	454	766			1256	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	74	30	304	21	289
Volume Left	74	0	0	21	0
Volume Right	0	30	63	0	0
cSH	454	766	1700	1256	1700
Volume to Capacity	0.16	0.04	0.18	0.02	0.17
Queue Length 95th (ft)	14	3	0	1	0
Control Delay (s)	14.5	9.9	0.0	7.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	13.1		0.0	0.5	
Approach LOS	B				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	90	30	16	191	282	77
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	33	17	208	307	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					677	
pX, platoon unblocked						
vC, conflicting volume	591	348	390			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	591	348	390			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	79	95	99			
cM capacity (veh/h)	463	695	1168			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	98	33	17	208	390
Volume Left	98	0	17	0	0
Volume Right	0	33	0	0	84
cSH	463	695	1168	1700	1700
Volume to Capacity	0.21	0.05	0.01	0.12	0.23
Queue Length 95th (ft)	20	4	1	0	0
Control Delay (s)	14.9	10.4	8.1	0.0	0.0
Lane LOS	B	B	A		
Approach Delay (s)	13.7		0.6		0.0
Approach LOS	B				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	15	2	201	7	7	285
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	2	218	8	8	310
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						980
pX, platoon unblocked						
vC, conflicting volume	547	222			226	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	547	222			226	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	100			99	
cM capacity (veh/h)	495	817			1342	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	18	226	8	310
Volume Left	16	0	8	0
Volume Right	2	8	0	0
cSH	519	1700	1342	1700
Volume to Capacity	0.04	0.13	0.01	0.18
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	12.2	0.0	7.7	0.0
Lane LOS	B		A	
Approach Delay (s)	12.2	0.0	0.2	
Approach LOS	B			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	20	24	195	274	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	22	26	212	298	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	567	303	308			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567	303	308			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	98			
cM capacity (veh/h)	475	737	1253			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	34	26	212	308
Volume Left	12	26	0	0
Volume Right	22	0	0	10
cSH	616	1253	1700	1700
Volume to Capacity	0.05	0.02	0.12	0.18
Queue Length 95th (ft)	4	2	0	0
Control Delay (s)	11.2	7.9	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.2	0.9		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	29.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	7	225	7	6	292
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	8	245	8	7	317
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	579	248			252	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	579	248			252	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	475	790			1313	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	13	252	7	317
Volume Left	5	0	7	0
Volume Right	8	8	0	0
cSH	619	1700	1313	1700
Volume to Capacity	0.02	0.15	0.00	0.19
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	10.9	0.0	7.8	0.0
Lane LOS	B		A	
Approach Delay (s)	10.9	0.0	0.2	
Approach LOS	B			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	25.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	1	33	3	0	2	60	221	2	2	273	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	1	36	3	0	2	65	240	2	2	297	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	687	687	310	709	699	241	323			242		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	687	687	310	709	699	241	323			242		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	95	99	100	100	95			100		
cM capacity (veh/h)	345	350	730	317	344	798	1237			1324		

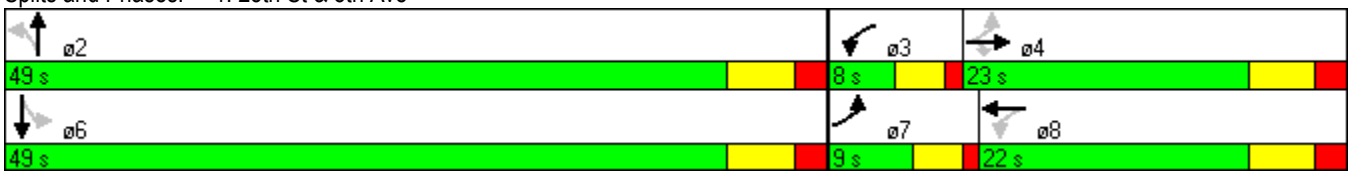
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	48	5	65	242	2	323
Volume Left	11	3	65	0	2	0
Volume Right	36	2	0	2	0	26
cSH	571	418	1237	1700	1324	1700
Volume to Capacity	0.08	0.01	0.05	0.14	0.00	0.19
Queue Length 95th (ft)	7	1	4	0	0	0
Control Delay (s)	11.9	13.7	8.1	0.0	7.7	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	11.9	13.7	1.7		0.1	
Approach LOS	B	B				

Intersection Summary				
Average Delay		1.7		
Intersection Capacity Utilization		32.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	101	80	41	22	75	46	56	298	28	60	504	80
Satd. Flow (prot)	1770	1863	1583	1770	1757	0	1770	1839	0	1770	1824	0
Flt Permitted	0.540			0.701			0.331			0.534		
Satd. Flow (perm)	1006	1863	1583	1306	1757	0	617	1839	0	995	1824	0
Satd. Flow (RTOR)			45		34			9			15	
Lane Group Flow (vph)	110	87	45	24	132	0	61	354	0	65	635	0
Turn Type	pm+pt		Perm	pm+pt			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Total Split (s)	9.0	23.0	23.0	8.0	22.0	0.0	49.0	49.0	0.0	49.0	49.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)	16.8	13.5	13.5	13.8	9.5		48.0	48.0		48.0	48.0	
Actuated g/C Ratio	0.23	0.19	0.19	0.19	0.13		0.66	0.66		0.66	0.66	
v/c Ratio	0.38	0.25	0.14	0.09	0.51		0.15	0.29		0.10	0.52	
Control Delay	24.7	27.7	10.0	19.8	29.4		9.2	8.5		8.2	11.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.7	27.7	10.0	19.8	29.4		9.2	8.5		8.2	11.3	
LOS	C	C	B	B	C		A	A		A	B	
Approach Delay		23.0			27.9			8.6			11.0	
Approach LOS		C			C			A			B	
Queue Length 50th (ft)	38	31	0	8	42		12	72		12	161	
Queue Length 95th (ft)	75	75	26	24	91		34	138		33	297	
Internal Link Dist (ft)		465			467			420			110	
Turn Bay Length (ft)	100		200	100			100			100		
Base Capacity (vph)	286	446	414	274	416		408	1219		658	1211	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.20	0.11	0.09	0.32		0.15	0.29		0.10	0.52	

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 72.5	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: 25th St & 8th Ave



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	92	43	360	75	36	563
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	100	47	391	82	39	612
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						500
pX, platoon unblocked	0.83					
vC, conflicting volume	1122	432			473	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1044	432			473	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	51	93			96	
cM capacity (veh/h)	203	623			1089	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	100	47	473	39	612
Volume Left	100	0	0	39	0
Volume Right	0	47	82	0	0
cSH	203	623	1700	1089	1700
Volume to Capacity	0.49	0.07	0.28	0.04	0.36
Queue Length 95th (ft)	61	6	0	3	0
Control Delay (s)	38.9	11.2	0.0	8.4	0.0
Lane LOS	E	B		A	
Approach Delay (s)	30.1		0.0	0.5	
Approach LOS	D				

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	117	59	34	322	544	111
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	64	37	350	591	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					677	
pX, platoon unblocked	0.85	0.85	0.85			
vC, conflicting volume	1076	652	712			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1000	500	571			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	42	87	96			
cM capacity (veh/h)	219	484	850			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	127	64	37	350	712
Volume Left	127	0	37	0	0
Volume Right	0	64	0	0	121
cSH	219	484	850	1700	1700
Volume to Capacity	0.58	0.13	0.04	0.21	0.42
Queue Length 95th (ft)	81	11	3	0	0
Control Delay (s)	42.0	13.6	9.4	0.0	0.0
Lane LOS	E	B	A		
Approach Delay (s)	32.5		0.9		0.0
Approach LOS	D				

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	16	12	330	13	24	534
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	13	359	14	26	580
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						980
pX, platoon unblocked						
vC, conflicting volume	998	366			373	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998	366			373	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	98			98	
cM capacity (veh/h)	264	679			1186	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	30	373	26	580
Volume Left	17	0	26	0
Volume Right	13	14	0	0
cSH	358	1700	1186	1700
Volume to Capacity	0.09	0.22	0.02	0.34
Queue Length 95th (ft)	7	0	2	0
Control Delay (s)	16.0	0.0	8.1	0.0
Lane LOS	C		A	
Approach Delay (s)	16.0	0.0	0.3	
Approach LOS	C			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	22	20	15	304	531	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	22	16	330	577	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	949	586	596			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	949	586	596			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	96	98			
cM capacity (veh/h)	284	510	981			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	46	16	330	596
Volume Left	24	16	0	0
Volume Right	22	0	0	18
cSH	360	981	1700	1700
Volume to Capacity	0.13	0.02	0.19	0.35
Queue Length 95th (ft)	11	1	0	0
Control Delay (s)	16.4	8.7	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	16.4	0.4		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	5	322	4	5	545
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	350	4	5	592
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	955	352			354	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	955	352			354	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	99			100	
cM capacity (veh/h)	285	691			1204	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	15	354	5	592
Volume Left	10	0	5	0
Volume Right	5	4	0	0
cSH	361	1700	1204	1700
Volume to Capacity	0.04	0.21	0.00	0.35
Queue Length 95th (ft)	3	0	0	0
Control Delay (s)	15.4	0.0	8.0	0.0
Lane LOS	C		A	
Approach Delay (s)	15.4	0.0	0.1	
Approach LOS	C			

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	58	4	0	1	85	313	2	1	538	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	63	4	0	1	92	340	2	1	585	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1129	1130	601	1176	1146	341	617			342		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1129	1130	601	1176	1146	341	617			342		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	87	97	100	100	90			100		
cM capacity (veh/h)	167	184	500	136	180	701	963			1217		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	79	5	92	342	1	617
Volume Left	16	4	92	0	1	0
Volume Right	63	1	0	2	0	33
cSH	355	162	963	1700	1217	1700
Volume to Capacity	0.22	0.03	0.10	0.20	0.00	0.36
Queue Length 95th (ft)	21	3	8	0	0	0
Control Delay (s)	18.0	28.0	9.1	0.0	8.0	0.0
Lane LOS	C	D	A		A	
Approach Delay (s)	18.0	28.0	1.9		0.0	
Approach LOS	C	D				

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		