Vanasse & Associates inc
Transportation Engineers & Planners

35 New England Business Center Drive
Suite 140
Andover, MA 01810

Ref: 9474

March 12, 2024

Franklin Zoning Board of Appeals
Bruce Hunchard, Chair
355 East Central Street
Franklin, MA 02038

Re: Response to Town Engineer Comment Letter dated February 29, 2024
Traffic Impact & Access Study Review – 121 Grove Street

Dear Mr. Hunchard:

Vanasse & Associates, Inc. (VAI) is pleased to provide responses to comments raised in the February 29, 2024 letter from Mr. Michael Maglio, Town Engineer in his review of the October 10, 2023 *Transportation Impact Analysis* report that was prepared by VAI in support of the proposed residential development to be located along Grove Street in Franklin, Massachusetts.

Traffic Impact Assessment Comments

Comment 1: *The Project Impact Statement indicates that the proposed community is projected to generate an estimated 43 new school age children. There should be an area within the site to accommodate school bus pickups and drop-offs. This area may be centrally located near the clubhouse, however it should be designed for the appropriate vehicle path and turn radii for buses. This area can also be used for the projected GATRA GO on-demand service that is recommended in the study.*

Response: Discussion with the Franklin Public Schools Transportation Coordinator (Denise Johnson with John Shipe, March 7, 2024) indicated that the school bus will not enter private property but will instead stop at the corner of Grove Street and the site driveway**.**

Comment 2: *The turning movement counts and intersection capacity analyses that were performed for the study only included weekday morning and evening peak hours. We recommend that Saturday midday peak hours also be evaluated, especially taking into consideration the traffic generated by the athletic fields and recreational areas during events at the nearby Beaver Pond located on Beaver St.*

Response: Based on ITE trip generation data for the Land Use Code 221 Multifamily Housing (Mid-Rise) the Project is expected to generate 1,508 vehicle trips (approximately 754 entering and exiting) on an average Saturday with 133 vehicle trips (68 entering and 65 exiting) expected during the Saturday Midday peak hour. These trips are less than the trips expected to be generated during an average weekday (1,528 vehicle trips), less than those during the weekday morning peak hour (134 vehicle trips), and comparable to those generated during the weekday evening peak hour (129 vehicle trips). Based on this, an

evaluation of the effects that the proposed Project will have on the Saturday Midday peak hour would be similar to or better than the already evaluated weekday morning and evening peak hours.

Comment 3: *Table 1 describes the existing traffic volumes on Grove St and references automatic traffic recorder (ATR) counts that were collected in May 2022, but the ATR data that was collected was not included in the appendices and there is no reference as to where, when, and for how long the data was collected. This information should be submitted for review.*

Response: Please see attached ATR count data. The data was collected by an automatic traffic recorder located on Grove Street in close proximity to the address 121 Grove Street for a continuous 48-hour period on Wednesday May 25, 2022 and Thursday May 26, 2022.

Comment 4: *There is no mention or assessment of vehicle speeds along Grove Street. Existing speed data needs to be collected and evaluated, especially as it relates to traffic and pedestrian safety along this section of the Grove St corridor.*

Response: Vehicle speeds observed in May of 2022 are as follows:

Table 1
OBSERVED VEHICLE SPEEDS (In Miles Per Hour)

Location/Direction	Average Speed	85th Percentile Speed[a]	Posted Speeds
Grove Street adjacent to the Site			
Northbound	34	38	40
Southbound	39	44	40

[a]The 85th percentile speed is the speed at which 85 percent of the traffic is traveling at or below. It is commonly used for setting speed limits on roadways.

The intersection count data indicated no pedestrians at the intersection of Grove Street and Beaver Street during the entire morning and evening count periods (4 hours total) and two bicyclists during the evening peak period (2 hours total) with no bicyclists observed during the morning peak period (2 hours total).

These speeds and pedestrian volumes are typical for an urban minor arterial. It is acknowledged that the Town's program to implement a multi-use path (See Comment No. 7) will greatly enhance bicycle and pedestrian access along the corridor.

Comment 5: *The sight distance analysis was noted to be based on the posted speed of 40 mph. Sight Distance should be reevaluated based on the 85% speeds as determined by collected speed data.*

Response: Table 7 of the TIA depicts the sight distance based on posted speed of 40 mph. As requested, sight distance based on the 85% speeds as determined by the collected speed data is as follows:

Table 2
SIGHT DISTANCE ANALYSIS (85th PERCENTILE SPEEDS)[a]

Intersection/Sight Distance Measurement	Recommended Distances (feet) based on observed speeds[b]	Field Measured Distances (Feet)
Grove Street at Project Site Driveway		
Stopping Sight Distance:		
Grove Street approaching from the north	350	481
Grove Street approaching from the south	280	500+
Intersection Sight Distance[c]:		
Left turn from site driveway (looking north)	490	420[d]
Left turn from site driveway (looking south)	420	500+[d]

[a]Recommended values obtained from *A Policy on Geometric Design of Highways and Streets,* 7th Edition; American Association of State Highway and Transportation Officials (AASHTO); 2018.
[b]85th percentile speeds of 38 mph northbound and 44 mph southbound.
[c]Values shown are the intersection sight distance for a vehicle turning right or left exiting a roadway under STOP control such that motorists approaching the intersection on the major street should not need to adjust their travel speed to less than 70 percent of their initial approach speed.
[d]Distance if trees in the sight triangles are cut.

The data results in the same conclusions as the TIA. The sight distance at the intersection of the Project site driveway with Grove Street exceeds the recommended values for Stopping Sight Distance (SSD). The distance available for Intersection Sight Distance (ISD) exceeds recommended values for ISD looking south but requires clearing of vegetation currently within the sight triangle. The measured ISD looking north (420 feet) is less than the recommended ISD value (490 feet); however, AASHTO states that the intersection can operate in a safe manner if the *available* ISD (420 feet) is equal to or greater than the recommended SSD (350 feet), which is the case for this condition.

Comment 6: *Existing heavy truck volumes along Grove St have also been omitted in the traffic study and should be taken into consideration along with the speed data as noted above.*

Response: Truck volumes were recorded and are shown in the count worksheets. The truck volumes were included in the original analysis but did not print out in the worksheets included in the TIA. The updated analysis reports that provide the heavy truck volume inputs are included in the Appendix to this response. Note that these are reprints of the analyses worksheets to include truck percentages; LOS does not change from the values shown in the report. In general, higher truck volumes were observed during the morning period and further north on Grove Street, with truck volumes on Grove Street just south of Route 140 averaging 53 vehicles per hour (vph) during the morning period but averaging 10 vph during the evening peak period.

Comment 7: *The study indicates that there are no roadway improvement projects planned within the study area beyond general maintenance, however the DPW is currently working with its contractor to construct a multi-use path at the southern end of Grove St from Washington St to the SNETT trail and further beyond to the intersection at Old Grove St. The Town's ultimate goal is to enhance bicycle and pedestrian access along the corridor by extending*

the multi-use trail to the entrance of the State Forest across from Beaver St and eventually connect to the Beaver Pond Recreational Area.

Response: This improvement was noted in the TIA and traffic volume networks showing the SNETT's progress to date were included. The intent of the Roadway Improvement Projects section was to note improvements that will have an effect on roadway and/or intersection capacity within the study area and should therefore be included in future-conditions intersection analysis.

As recommended, consideration was given to implementation of median islands and turn lanes on Grove Street. Traffic calming seeks to slow the pace of vehicles on town roads. The addition of turn lanes would allow through vehicles to maintain or increase speeds as vehicles pull into turn lanes to wait for a gap before turning into the driveway. Conversely, vehicles required to slow down in general purpose lanes and potentially stop traffic behind them waiting for a gap in opposing traffic will decrease average speeds on Grove Street. This is also the intention of school bus drivers, which is to stop through traffic in both directions, while turn lanes would be contrary to what the school bus drivers want.

In addition, a review of turn-lane volume warrants for the peak hours indicated that left-turn volumes do not warrant the installation of a left-turn lane and right-turn volumes indicated a right-turn lane is warranted but only for the weekday evening peak hour. Reaching warrant levels for only one hour would guide against the installation of a right-turn lane. It should also be noted that a reduction in vehicle speeds to the posted speed limit would change the analysis such that the right-turn lane would no longer be warranted. Considering these trade-offs, we do not recommend the addition of a median island or turn lanes.

The updated information has been incorporated as noted above. While incorporation of this data complements the integrity of the report, it does not change any of the conclusions nor the recommended mitigation. I trust that this information is responsive to the comments that were identified concerning the review of the VAI October 10, 2023 report. If you should have any questions or would like to discuss our responses in more detail, please feel free to contact me.

Sincerely,

VANASSE & ASSOCIATES, INC.

Scott W. Thornton

Scott W. Thornton, P.E.
Principal

Professional Engineer in CT, MA, NH

Technical Appendix
- Automatic Traffic Recorder Data
- Vehicle Speed Data
- Updated Capacity Analysis (with truck percentages shown)

Cc: R. Hewitt, Fairfield Residential
File

APPENDIX

TRAFFIC COUNT DATA
VEHICLE SPEED DATA
UPDATED CAPACITY ANALYSIS

TRAFFIC COUNT DATA

Grove Street
near# 121
City, State: **Franklin, MA**
Client: **RMA/ R. Muller**
Site Code: **22005**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **228675 ATR-A**

Count Date:
Wednesday, May, 25, 2022

Volume

NB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	8		12:00 PM	100	
12:15 AM	3		12:15 PM	80	
12:30 AM	4		12:30 PM	87	
12:45 AM	5	20	12:45 PM	73	340
1:00 AM	3		1:00 PM	77	
1:15 AM	2		1:15 PM	78	
1:30 AM	1		1:30 PM	60	
1:45 AM	2	8	1:45 PM	82	297
2:00 AM	1		2:00 PM	76	
2:15 AM	2		2:15 PM	58	
2:30 AM	4		2:30 PM	80	
2:45 AM	4	11	2:45 PM	66	280
3:00 AM	1		3:00 PM	92	
3:15 AM	2		3:15 PM	65	
3:30 AM	3		3:30 PM	95	
3:45 AM	9	15	3:45 PM	87	339
4:00 AM	5		4:00 PM	102	
4:15 AM	7		4:15 PM	79	
4:30 AM	6		4:30 PM	126	
4:45 AM	9	27	4:45 PM	102	409
5:00 AM	12		5:00 PM	119	
5:15 AM	19		5:15 PM	86	
5:30 AM	25		5:30 PM	77	
5:45 AM	36	92	5:45 PM	67	349
6:00 AM	41		6:00 PM	57	
6:15 AM	60		6:15 PM	48	
6:30 AM	70		6:30 PM	58	
6:45 AM	97	268	6:45 PM	53	216
7:00 AM	96		7:00 PM	55	
7:15 AM	130		7:15 PM	30	
7:30 AM	105		7:30 PM	44	
7:45 AM	98	429	7:45 PM	41	170
8:00 AM	79		8:00 PM	32	
8:15 AM	80		8:15 PM	53	
8:30 AM	79		8:30 PM	23	
8:45 AM	81	319	8:45 PM	23	131
9:00 AM	60		9:00 PM	21	
9:15 AM	82		9:15 PM	22	
9:30 AM	82		9:30 PM	17	
9:45 AM	64	288	9:45 PM	13	73
10:00 AM	81		10:00 PM	15	
10:15 AM	60		10:15 PM	9	
10:30 AM	60		10:30 PM	4	
10:45 AM	80	281	10:45 PM	4	32
11:00 AM	67		11:00 PM	8	
11:15 AM	60		11:15 PM	3	
11:30 AM	53		11:30 PM	8	
11:45 AM	79	259	11:45 PM	6	25
Total	2017			2661	
Percent	43.12%			56.88%	
Day Total			4678		
Peak Hour	7:00 AM			4:30 PM	
Volume	429			433	
P.H.F.	0.825			0.859	

SB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	6		12:00 PM	63	
12:15 AM	4		12:15 PM	81	
12:30 AM	7		12:30 PM	59	
12:45 AM	5	22	12:45 PM	100	303
1:00 AM	4		1:00 PM	80	
1:15 AM	1		1:15 PM	82	
1:30 AM	4		1:30 PM	86	
1:45 AM	1	10	1:45 PM	62	310
2:00 AM	2		2:00 PM	70	
2:15 AM	2		2:15 PM	113	
2:30 AM	3		2:30 PM	94	
2:45 AM	2	9	2:45 PM	90	367
3:00 AM	4		3:00 PM	93	
3:15 AM	6		3:15 PM	114	
3:30 AM	0		3:30 PM	81	
3:45 AM	3	13	3:45 PM	93	381
4:00 AM	3		4:00 PM	78	
4:15 AM	8		4:15 PM	92	
4:30 AM	12		4:30 PM	118	
4:45 AM	23	46	4:45 PM	92	380
5:00 AM	14		5:00 PM	114	
5:15 AM	21		5:15 PM	110	
5:30 AM	17		5:30 PM	99	
5:45 AM	34	86	5:45 PM	67	390
6:00 AM	29		6:00 PM	82	
6:15 AM	20		6:15 PM	65	
6:30 AM	30		6:30 PM	66	
6:45 AM	53	132	6:45 PM	48	261
7:00 AM	53		7:00 PM	64	
7:15 AM	76		7:15 PM	56	
7:30 AM	87		7:30 PM	44	
7:45 AM	103	319	7:45 PM	43	207
8:00 AM	77		8:00 PM	52	
8:15 AM	95		8:15 PM	43	
8:30 AM	96		8:30 PM	33	
8:45 AM	67	335	8:45 PM	26	154
9:00 AM	55		9:00 PM	31	
9:15 AM	59		9:15 PM	23	
9:30 AM	45		9:30 PM	9	
9:45 AM	56	215	9:45 PM	19	82
10:00 AM	65		10:00 PM	22	
10:15 AM	49		10:15 PM	10	
10:30 AM	49		10:30 PM	7	
10:45 AM	61	224	10:45 PM	2	41
11:00 AM	51		11:00 PM	9	
11:15 AM	61		11:15 PM	5	
11:30 AM	65		11:30 PM	1	
11:45 AM	74	251	11:45 PM	5	20
Total	1662			2896	
Percent	36.46%			63.54%	
Day Total			4558		
Peak Hour	7:45 AM			4:30 PM	
Volume	371			434	
P.H.F.	0.900			0.919	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	14		12:00 PM	163	
12:15 AM	7		12:15 PM	161	
12:30 AM	11		12:30 PM	146	
12:45 AM	10	42	12:45 PM	173	643
1:00 AM	7		1:00 PM	157	
1:15 AM	3		1:15 PM	160	
1:30 AM	5		1:30 PM	146	
1:45 AM	3	18	1:45 PM	144	607
2:00 AM	3		2:00 PM	146	
2:15 AM	4		2:15 PM	171	
2:30 AM	7		2:30 PM	174	
2:45 AM	6	20	2:45 PM	156	647
3:00 AM	5		3:00 PM	185	
3:15 AM	8		3:15 PM	179	
3:30 AM	3		3:30 PM	176	
3:45 AM	12	28	3:45 PM	180	720
4:00 AM	8		4:00 PM	180	
4:15 AM	15		4:15 PM	171	
4:30 AM	18		4:30 PM	244	
4:45 AM	32	73	4:45 PM	194	789
5:00 AM	26		5:00 PM	233	
5:15 AM	40		5:15 PM	196	
5:30 AM	42		5:30 PM	176	
5:45 AM	70	178	5:45 PM	134	739
6:00 AM	70		6:00 PM	139	
6:15 AM	80		6:15 PM	113	
6:30 AM	100		6:30 PM	124	
6:45 AM	150	400	6:45 PM	101	477
7:00 AM	149		7:00 PM	119	
7:15 AM	206		7:15 PM	86	
7:30 AM	192		7:30 PM	88	
7:45 AM	201	748	7:45 PM	84	377
8:00 AM	156		8:00 PM	84	
8:15 AM	175		8:15 PM	96	
8:30 AM	175		8:30 PM	56	
8:45 AM	148	654	8:45 PM	49	285
9:00 AM	115		9:00 PM	52	
9:15 AM	141		9:15 PM	45	
9:30 AM	127		9:30 PM	26	
9:45 AM	120	503	9:45 PM	32	155
10:00 AM	146		10:00 PM	37	
10:15 AM	109		10:15 PM	19	
10:30 AM	109		10:30 PM	11	
10:45 AM	141	505	10:45 PM	6	73
11:00 AM	118		11:00 PM	17	
11:15 AM	121		11:15 PM	8	
11:30 AM	118		11:30 PM	9	
11:45 AM	153	510	11:45 PM	11	45
Total	3679			5557	
Percent	39.83%			60.17%	
Day Total			9236		
Peak Hour	7:15 AM			4:30 PM	
Volume	755			867	
P.H.F.	0.916			0.888	

Grove Street
near# 121
City, State: **Franklin, MA**
Client: **RMA/ R. Muller**
Site Code: **22005**

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: **228675 ATR-A**

Count Date:
Thursday, May 26, 2022

Volume

NB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	3		12:00 PM	92	
12:15 AM	3		12:15 PM	82	
12:30 AM	1		12:30 PM	81	
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1:15 AM	2		1:15 PM	61	
1:30 AM	1		1:30 PM	68	
1:45 AM	5	10	1:45 PM	81	300
2:00 AM	3		2:00 PM	68	
2:15 AM	4		2:15 PM	61	
2:30 AM	2		2:30 PM	77	
2:45 AM	2	11	2:45 PM	72	278
3:00 AM	2		3:00 PM	97	
3:15 AM	2		3:15 PM	90	
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3:45 AM	1	6	3:45 PM	75	371
4:00 AM	7		4:00 PM	87	
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4:30 AM	11		4:30 PM	106	
4:45 AM	10	33	4:45 PM	90	371
5:00 AM	12		5:00 PM	113	
5:15 AM	13		5:15 PM	92	
5:30 AM	20		5:30 PM	63	
5:45 AM	38	83	5:45 PM	68	336
6:00 AM	36		6:00 PM	74	
6:15 AM	52		6:15 PM	63	
6:30 AM	62		6:30 PM	52	
6:45 AM	88	238	6:45 PM	56	245
7:00 AM	114		7:00 PM	58	
7:15 AM	110		7:15 PM	53	
7:30 AM	81		7:30 PM	43	
7:45 AM	74	379	7:45 PM	29	183
8:00 AM	79		8:00 PM	34	
8:15 AM	79		8:15 PM	26	
8:30 AM	100		8:30 PM	34	
8:45 AM	98	356	8:45 PM	34	128
9:00 AM	60		9:00 PM	21	
9:15 AM	63		9:15 PM	15	
9:30 AM	74		9:30 PM	7	
9:45 AM	72	269	9:45 PM	16	59
10:00 AM	58		10:00 PM	13	
10:15 AM	54		10:15 PM	5	
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10:45 AM	69	234	10:45 PM	6	35
11:00 AM	64		11:00 PM	5	
11:15 AM	65		11:15 PM	2	
11:30 AM	91		11:30 PM	3	
11:45 AM	83	303	11:45 PM	0	10
Total	1933			2648	
Percent	42.20%			57.80%	
Day Total			4581		
Peak Hour	6:45 AM			4:30 PM	
Volume	393			401	
P.H.F.	0.862			0.887	

SB

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	8		12:00 PM	87	
12:15 AM	0		12:15 PM	91	
12:30 AM	6		12:30 PM	71	
12:45 AM	5	19	12:45 PM	103	352
1:00 AM	2		1:00 PM	72	
1:15 AM	3		1:15 PM	94	
1:30 AM	5		1:30 PM	74	
1:45 AM	3	13	1:45 PM	61	301
2:00 AM	4		2:00 PM	87	
2:15 AM	1		2:15 PM	114	
2:30 AM	2		2:30 PM	88	
2:45 AM	5	12	2:45 PM	76	365
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4:45 AM	17	35	4:45 PM	100	389
5:00 AM	4		5:00 PM	111	
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5:30 AM	13		5:30 PM	75	
5:45 AM	35	72	5:45 PM	80	366
6:00 AM	32		6:00 PM	68	
6:15 AM	23		6:15 PM	74	
6:30 AM	33		6:30 PM	50	
6:45 AM	46	134	6:45 PM	52	244
7:00 AM	57		7:00 PM	55	
7:15 AM	69		7:15 PM	56	
7:30 AM	86		7:30 PM	52	
7:45 AM	93	305	7:45 PM	40	203
8:00 AM	69		8:00 PM	57	
8:15 AM	99		8:15 PM	46	
8:30 AM	84		8:30 PM	32	
8:45 AM	53	305	8:45 PM	28	163
9:00 AM	58		9:00 PM	32	
9:15 AM	50		9:15 PM	15	
9:30 AM	56		9:30 PM	22	
9:45 AM	49	213	9:45 PM	14	83
10:00 AM	62		10:00 PM	9	
10:15 AM	56		10:15 PM	15	
10:30 AM	52		10:30 PM	9	
10:45 AM	53	223	10:45 PM	6	39
11:00 AM	42		11:00 PM	9	
11:15 AM	62		11:15 PM	6	
11:30 AM	86		11:30 PM	3	
11:45 AM	62	252	11:45 PM	5	23
Total	1593			2905	
Percent	35.42%			64.58%	
Day Total			4498		
Peak Hour	7:30 AM			4:30 PM	
Volume	347			427	
P.H.F.	0.876			0.920	

Combined

Start Time:	15 min	60 min		15 min	60 min
12:00 AM	11		12:00 PM	179	
12:15 AM	3		12:15 PM	173	
12:30 AM	7		12:30 PM	152	
12:45 AM	9	30	12:45 PM	180	684
1:00 AM	4		1:00 PM	162	
1:15 AM	5		1:15 PM	155	
1:30 AM	6		1:30 PM	142	
1:45 AM	8	23	1:45 PM	142	601
2:00 AM	7		2:00 PM	155	
2:15 AM	5		2:15 PM	175	
2:30 AM	4		2:30 PM	165	
2:45 AM	7	23	2:45 PM	148	643
3:00 AM	5		3:00 PM	196	
3:15 AM	5		3:15 PM	196	
3:30 AM	4		3:30 PM	194	
3:45 AM	2	16	3:45 PM	162	748
4:00 AM	15		4:00 PM	176	
4:15 AM	8		4:15 PM	172	
4:30 AM	18		4:30 PM	222	
4:45 AM	27	68	4:45 PM	190	760
5:00 AM	16		5:00 PM	224	
5:15 AM	33		5:15 PM	192	
5:30 AM	33		5:30 PM	138	
5:45 AM	73	155	5:45 PM	148	702
6:00 AM	68		6:00 PM	142	
6:15 AM	75		6:15 PM	137	
6:30 AM	95		6:30 PM	102	
6:45 AM	134	372	6:45 PM	108	489
7:00 AM	171		7:00 PM	113	
7:15 AM	179		7:15 PM	109	
7:30 AM	167		7:30 PM	95	
7:45 AM	167	684	7:45 PM	69	386
8:00 AM	148		8:00 PM	91	
8:15 AM	178		8:15 PM	72	
8:30 AM	184		8:30 PM	66	
8:45 AM	151	661	8:45 PM	62	291
9:00 AM	118		9:00 PM	53	
9:15 AM	113		9:15 PM	30	
9:30 AM	130		9:30 PM	29	
9:45 AM	121	482	9:45 PM	30	142
10:00 AM	120		10:00 PM	22	
10:15 AM	110		10:15 PM	20	
10:30 AM	105		10:30 PM	20	
10:45 AM	122	457	10:45 PM	12	74
11:00 AM	106		11:00 PM	14	
11:15 AM	127		11:15 PM	8	
11:30 AM	177		11:30 PM	6	
11:45 AM	145	555	11:45 PM	5	33
Total	3526			5553	
Percent	38.84%			61.16%	
Day Total			9079		
Peak Hour	7:00 AM			4:30 PM	
Volume	684			828	
P.H.F.	0.955			0.924	

VEHICLE SPEED DATA

Grove Street
near# 121
City, State: Franklin, MA
Client: RMA/ R. Muller
Site Code: 22005

PRECISION DATA INDUSTRIES, LLC
157 Washington Street, Suite 2
Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 228675 ATR-A

Count Date
Wednesday, May, 25, 2022

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	3	5	10	1	1	0	0	0	0	0	20	38.0	34.9
1:00 AM	0	0	0	2	2	1	3	0	0	0	0	0	0	8	40.0	34.1
2:00 AM	0	0	0	0	4	5	2	0	0	0	0	0	0	11	40.0	35.8
3:00 AM	0	0	0	1	6	6	1	1	0	0	0	0	0	15	38.0	35.4
4:00 AM	0	0	0	6	9	10	1	1	0	0	0	0	0	27	37.0	33.5
5:00 AM	0	0	0	3	24	52	11	1	1	0	0	0	0	92	39.0	36.2
6:00 AM	0	0	6	16	88	128	28	1	1	0	0	0	0	268	39.0	35.0
7:00 AM	7	0	0	27	192	178	24	0	0	0	1	0	0	429	38.0	34.0
8:00 AM	0	1	3	41	137	117	20	0	0	0	0	0	0	319	38.0	33.8
9:00 AM	0	0	3	53	144	84	4	0	0	0	0	0	0	288	37.0	32.7
10:00 AM	0	0	6	22	145	94	13	0	1	0	0	0	0	281	38.0	33.7
11:00 AM	0	0	8	20	97	110	23	0	1	0	0	0	0	259	38.0	34.3
12:00 PM	0	0	4	28	153	134	20	1	0	0	0	0	0	340	38.0	34.1
1:00 PM	1	0	0	25	119	128	22	2	0	0	0	0	0	297	38.0	34.4
2:00 PM	2	0	1	44	102	114	16	1	0	0	0	0	0	280	38.0	33.8
3:00 PM	0	1	2	31	125	149	29	2	0	0	0	0	0	339	38.0	34.5
4:00 PM	0	0	0	23	153	215	16	1	0	1	0	0	0	409	38.0	34.8
5:00 PM	1	0	2	17	132	174	21	2	0	0	0	0	0	349	38.0	34.9
6:00 PM	0	0	0	6	89	104	15	1	1	0	0	0	0	216	38.0	35.2
7:00 PM	0	0	1	13	71	73	10	2	0	0	0	0	0	170	37.0	34.4
8:00 PM	0	0	1	11	65	48	5	1	0	0	0	0	0	131	38.0	34.0
9:00 PM	0	0	1	6	30	30	5	1	0	0	0	0	0	73	38.2	34.6
10:00 PM	0	0	0	1	12	15	3	1	0	0	0	0	0	32	39.0	35.4
11:00 PM	0	0	0	0	11	11	2	1	0	0	0	0	0	25	37.4	35.2
Total	11	2	38	399	1915	1990	295	21	5	1	1	0	0	4678	38.0	34.3
Percent	0.24%	0.04%	0.81%	8.53%	40.94%	42.54%	6.31%	0.45%	0.11%	0.02%	0.02%	0.00%	0.00%			
AM Peak	7:00 AM	8:00 AM	11:00 AM	9:00 AM	7:00 AM	7:00 AM	6:00 AM	12:00 AM	5:00 AM		7:00 AM			7:00 AM		
Volume	7	1	8	53	192	178	28	1	1	0	1	0	0	429		
PM Peak	2:00 PM	3:00 PM	12:00 PM	2:00 PM	12:00 PM	4:00 PM	3:00 PM	1:00 PM	6:00 PM	4:00 PM				4:00 PM		
Volume	2	1	4	44	153	215	29	2	1	1	0	0	0	409		

15th Percentile:	31.0 MPH	Average Speed:	34.3 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	34.0 MPH	10 MPH Pace:	30 to 39 MPH	Number of Vehicles > 35 MPH:	1826
85th Percentile:	38.0 MPH	Number in Pace:	3905	Percent of Vehicles > 35 MPH:	39.0%
95th Percentile:	40.0 MPH	Percent in Pace:	83.5%		

Grove Street
near# 121
City, State: Franklin, MA
Client: RMA/ R. Muller
Site Code: 22005

PRECISION DATA INDUSTRIES, LLC
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Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 228675 ATR-A

Count Date
Wednesday, May, 25, 2022

Speed (60-minute)

SB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	1	2	9	7	0	1	2	0	0	0	22	42.7	40.0
1:00 AM	1	1	0	0	3	0	3	2	0	0	0	0	0	10	44.7	34.1
2:00 AM	0	0	0	0	1	2	3	2	0	1	0	0	0	9	47.4	42.4
3:00 AM	0	0	1	3	0	0	3	5	1	0	0	0	0	13	48.2	39.7
4:00 AM	0	0	0	1	12	18	11	1	1	2	0	0	0	46	42.3	37.9
5:00 AM	0	1	1	1	5	19	33	21	3	2	0	0	0	86	46.3	41.4
6:00 AM	0	2	3	2	8	35	51	24	7	0	0	0	0	132	46.0	40.5
7:00 AM	2	5	7	10	64	112	93	23	3	0	0	0	0	319	43.0	37.2
8:00 AM	1	3	5	38	65	122	75	26	0	0	0	0	0	335	42.9	36.4
9:00 AM	0	0	3	8	40	82	63	19	0	0	0	0	0	215	43.0	37.7
10:00 AM	1	1	0	7	30	80	78	24	3	0	0	0	0	224	44.0	39.0
11:00 AM	1	0	2	9	41	86	93	16	3	0	0	0	0	251	43.0	38.2
12:00 PM	0	0	3	5	51	119	98	21	6	0	0	0	0	303	43.0	38.3
1:00 PM	0	0	6	8	46	101	98	44	5	2	0	0	0	310	45.0	39.1
2:00 PM	1	0	6	22	60	124	121	20	13	0	0	0	0	367	43.0	38.1
3:00 PM	0	0	0	5	43	128	152	49	3	1	0	0	0	381	44.0	39.7
4:00 PM	1	3	0	1	40	126	145	58	6	0	0	0	0	380	45.0	39.9
5:00 PM	3	2	0	1	16	112	187	63	6	0	0	0	0	390	45.0	40.8
6:00 PM	1	0	0	0	13	68	124	48	6	1	0	0	0	261	45.0	41.3
7:00 PM	0	0	0	0	17	59	92	34	5	0	0	0	0	207	45.0	41.0
8:00 PM	0	0	0	0	14	50	56	33	1	0	0	0	0	154	46.0	40.6
9:00 PM	0	0	0	0	6	29	28	17	1	1	0	0	0	82	46.0	41.1
10:00 PM	0	0	0	1	3	13	18	4	1	1	0	0	0	41	44.0	40.7
11:00 PM	0	0	0	0	3	3	7	4	3	0	0	0	0	20	46.6	42.0
Total	12	18	37	123	583	1497	1639	558	78	13	0	0	0	4558	44.0	39.2
Percent	0.26%	0.39%	0.81%	2.70%	12.79%	32.84%	35.96%	12.24%	1.71%	0.29%	0.00%	0.00%	0.00%			
AM Peak	7:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	8:00 AM	6:00 AM	12:00 AM				8:00 AM		
Volume	2	5	7	38	65	122	93	26	7	2	0	0	0	335		
PM Peak	5:00 PM	4:00 PM	1:00 PM	2:00 PM	2:00 PM	3:00 PM	5:00 PM	5:00 PM	2:00 PM	1:00 PM				5:00 PM		
Volume	3	3	6	22	60	128	187	63	13	2	0	0	0	390		

15th Percentile:	34.0 MPH	Average Speed:	39.2 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	40.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 35 MPH:	3575
85th Percentile:	44.0 MPH	Number in Pace:	3136	Percent of Vehicles > 35 MPH:	78.4%
95th Percentile:	47.0 MPH	Percent in Pace:	68.8%		

Grove Street
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Site Code: 22005

PRECISION DATA INDUSTRIES, LLC
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Hudson, MA 01749
Office: 508-875-0100 Fax: 508-875-0118

PDI File #: 228675 ATR-A

Count Date
Thursday, May 26, 2022

Speed (60-minute)

NB

Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	1	0	4	6	0	0	0	0	0	0	0	11	36.0	33.4
1:00 AM	0	0	0	1	5	3	1	0	0	0	0	0	0	10	38.7	34.6
2:00 AM	0	0	0	0	7	4	0	0	0	0	0	0	0	11	35.0	33.4
3:00 AM	0	0	0	1	3	1	0	1	0	0	0	0	0	6	38.3	34.2
4:00 AM	0	0	0	5	10	12	6	0	0	0	0	0	0	33	40.0	34.9
5:00 AM	0	0	0	3	38	32	9	1	0	0	0	0	0	83	39.0	35.0
6:00 AM	0	1	1	14	71	126	25	0	0	0	0	0	0	238	39.0	35.3
7:00 AM	1	0	1	32	158	169	17	1	0	0	0	0	0	379	37.0	34.2
8:00 AM	3	0	3	39	171	123	15	2	0	0	0	0	0	356	37.0	33.5
9:00 AM	0	5	4	38	146	68	8	0	0	0	0	0	0	269	36.0	32.4
10:00 AM	0	0	2	39	91	90	12	0	0	0	0	0	0	234	37.0	33.5
11:00 AM	2	1	5	47	125	105	18	0	0	0	0	0	0	303	37.0	33.2
12:00 PM	1	0	1	31	137	142	19	1	0	0	0	0	0	332	38.0	34.1
1:00 PM	0	8	9	30	122	109	19	1	1	1	0	0	0	300	38.0	33.5
2:00 PM	0	0	2	25	95	140	15	1	0	0	0	0	0	278	38.0	34.6
3:00 PM	1	0	2	49	162	141	15	0	0	1	0	0	0	371	37.0	33.6
4:00 PM	4	1	4	22	155	165	20	0	0	0	0	0	0	371	38.0	34.1
5:00 PM	0	0	3	27	111	163	30	2	0	0	0	0	0	336	38.8	34.9
6:00 PM	0	0	1	15	81	129	18	1	0	0	0	0	0	245	38.0	35.1
7:00 PM	0	0	1	12	83	73	11	3	0	0	0	0	0	183	38.0	34.5
8:00 PM	0	0	2	5	58	51	11	1	0	0	0	0	0	128	38.0	34.6
9:00 PM	0	0	1	2	18	34	3	1	0	0	0	0	0	59	38.3	35.4
10:00 PM	0	0	0	1	11	16	4	3	0	0	0	0	0	35	40.9	36.3
11:00 PM	0	0	0	3	4	3	0	0	0	0	0	0	0	10	37.3	32.9
Total	12	16	43	441	1866	1905	276	19	1	2	0	0	0	4581	38.0	34.1
Percent	0.26%	0.35%	0.94%	9.63%	40.73%	41.58%	6.02%	0.41%	0.02%	0.04%	0.00%	0.00%	0.00%			
AM Peak	8:00 AM	9:00 AM	11:00 AM	11:00 AM	8:00 AM	7:00 AM	6:00 AM	8:00 AM						7:00 AM		
Volume	3	5	5	47	171	169	25	2	0	0	0	0	0	379		
PM Peak	4:00 PM	1:00 PM	1:00 PM	3:00 PM	3:00 PM	4:00 PM	5:00 PM	7:00 PM	1:00 PM	1:00 PM				3:00 PM		
Volume	4	8	9	49	162	165	30	3	1	1	0	0	0	371		

15th Percentile:	30.0 MPH	Average Speed:	34.1 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	34.0 MPH	10 MPH Pace:	30 to 39 MPH	Number of Vehicles > 35 MPH:	1647
85th Percentile:	38.0 MPH	Number in Pace:	3771	Percent of Vehicles > 35 MPH:	36.0%
95th Percentile:	40.0 MPH	Percent in Pace:	82.3%		

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Count Date
Thursday, May 26, 2022

Speed (60-minute)

SB

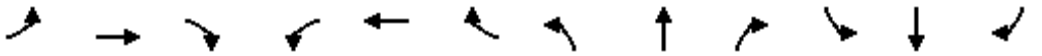
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	2	1	11	1	0	3	1	0	0	19	55.3	44.3
1:00 AM	0	0	0	1	2	2	4	2	1	1	0	0	0	13	49.2	41.5
2:00 AM	0	0	0	1	2	4	2	3	0	0	0	0	0	12	46.4	39.3
3:00 AM	0	0	0	2	0	4	3	1	0	0	0	0	0	10	42.7	37.8
4:00 AM	0	0	0	1	5	11	9	8	0	1	0	0	0	35	45.0	39.8
5:00 AM	0	0	0	3	10	20	26	8	3	2	0	0	0	72	45.0	39.9
6:00 AM	0	0	0	4	10	42	45	25	8	0	0	0	0	134	47.0	40.7
7:00 AM	3	8	9	15	40	92	108	26	4	0	0	0	0	305	43.0	37.2
8:00 AM	11	6	3	18	52	123	77	13	2	0	0	0	0	305	42.0	35.9
9:00 AM	2	0	0	7	34	78	69	22	1	0	0	0	0	213	43.0	38.3
10:00 AM	0	0	3	16	36	62	75	24	6	1	0	0	0	223	44.0	38.4
11:00 AM	5	5	6	12	46	70	82	24	1	1	0	0	0	252	43.0	37.0
12:00 PM	2	4	4	9	58	140	96	37	2	0	0	0	0	352	44.0	37.9
1:00 PM	0	1	2	10	50	103	103	26	6	0	0	0	0	301	44.0	38.6
2:00 PM	0	0	6	17	60	128	113	40	1	0	0	0	0	365	44.0	38.2
3:00 PM	2	3	3	11	34	134	137	49	4	0	0	0	0	377	44.0	39.1
4:00 PM	0	1	1	7	22	131	166	53	7	1	0	0	0	389	45.0	40.3
5:00 PM	2	0	0	4	15	110	177	49	8	1	0	0	0	366	45.0	40.5
6:00 PM	0	0	0	7	21	65	96	47	8	0	0	0	0	244	45.0	40.8
7:00 PM	0	0	0	1	10	53	102	35	1	1	0	0	0	203	45.0	41.0
8:00 PM	0	0	0	2	7	51	82	16	2	1	2	0	0	163	44.0	40.9
9:00 PM	0	0	0	2	3	27	37	9	5	0	0	0	0	83	45.7	41.0
10:00 PM	0	0	0	1	2	9	17	6	3	0	0	1	0	39	46.0	42.1
11:00 PM	0	0	0	0	2	6	8	4	1	1	1	0	0	23	46.7	42.7
Total	27	28	37	151	523	1466	1645	528	74	14	4	1	0	4498	44.0	39.0
Percent	0.60%	0.62%	0.82%	3.36%	11.63%	32.59%	36.57%	11.74%	1.65%	0.31%	0.09%	0.02%	0.00%			
AM Peak	8:00 AM	7:00 AM	7:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	7:00 AM	6:00 AM	12:00 AM	12:00 AM			7:00 AM		
Volume	11	8	9	18	52	123	108	26	8	3	1	0	0	305		
PM Peak	12:00 PM	12:00 PM	2:00 PM	2:00 PM	2:00 PM	12:00 PM	5:00 PM	4:00 PM	5:00 PM	4:00 PM	8:00 PM	10:00 PM		4:00 PM		
Volume	2	4	6	17	60	140	177	53	8	1	2	1	0	389		

15th Percentile:	34.0 MPH	Average Speed:	39.0 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	40.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 35 MPH:	3532
85th Percentile:	44.0 MPH	Number in Pace:	3111	Percent of Vehicles > 35 MPH:	78.5%
95th Percentile:	47.0 MPH	Percent in Pace:	69.2%		

UPDATED CAPACITY ANALYSIS

2023 Existing Weekday Morning Peak Hour
2023 Existing Weekday Evening Peak Hour
2030 No-Build Weekday Morning Peak Hour
2030 No-Build Weekday Evening Peak Hour
2030 Build Weekday Morning Peak Hour
2030 Build Weekday Evening Peak Hour

2023 Existing Weekday Morning Peak Hour



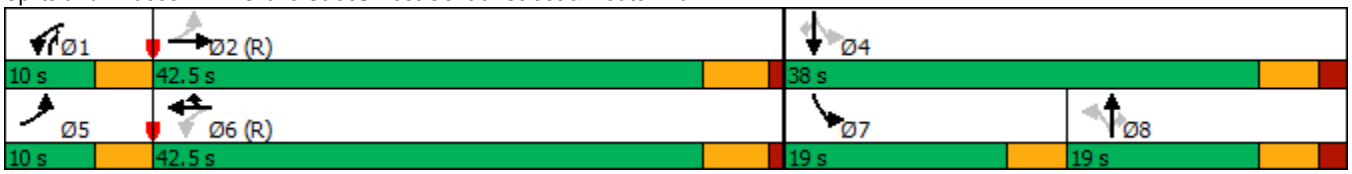
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	663	59	354	690	200	62	35	303	153	28	11
Future Volume (vph)	9	663	59	354	690	200	62	35	303	153	28	11
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1805	3196	0	3083	3172	1501	0	1784	1531	1711	1766	1777
Flt Permitted	0.376			0.200				0.785		0.504		
Satd. Flow (perm)	714	3196	0	649	3172	1501	0	1445	1531	908	1766	1777
Satd. Flow (RTOR)		12				211			193			78
Peak Hour Factor	0.84	0.84	0.84	0.95	0.95	0.95	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	12%	7%	6%	10%	4%	5%	0%	9%	2%	4%	0%
Adj. Flow (vph)	11	789	70	373	726	211	75	42	365	184	34	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	859	0	373	726	211	0	117	365	184	34	13
Turn Type	pm+pt	NA		pm+pt	NA	Prot	Perm	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6	6		8	1	7	4	
Permitted Phases	2			6			8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.5		9.0	10.5	10.5	11.0	11.0	9.0	9.0	11.0	11.0
Total Split (s)	10.0	42.5		10.0	42.5	42.5	19.0	19.0	10.0	19.0	38.0	38.0
Total Split (%)	11.0%	47.0%		11.0%	47.0%	47.0%	21.0%	21.0%	11.0%	21.0%	42.0%	42.0%
Maximum Green (s)	6.0	37.0		6.0	37.0	37.0	13.0	13.0	6.0	15.0	32.0	32.0
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	2.0	2.0	0.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5		4.0	5.5	5.5		6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	None
Act Effct Green (s)	44.6	37.4		50.4	47.7	47.7		11.3	25.6	31.3	29.3	29.3
Actuated g/C Ratio	0.49	0.41		0.56	0.53	0.53		0.12	0.28	0.35	0.32	0.32
v/c Ratio	0.03	0.65		0.64	0.43	0.24		0.65	0.64	0.42	0.06	0.02
Control Delay	10.6	24.5		18.1	15.7	3.1		54.5	18.6	23.8	19.5	0.1
Queue Delay	0.0	0.0		0.0	0.5	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	24.5		18.1	16.2	3.1		54.5	18.6	23.8	19.5	0.1
LOS	B	C		B	B	A		D	B	C	B	A
Approach Delay		24.3			14.6			27.3			21.9	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	3	222		54	128	0		64	75	73	13	0
Queue Length 95th (ft)	10	241		#91	220	41		109	151	112	30	0
Internal Link Dist (ft)		637			292			3128			651	
Turn Bay Length (ft)	125			225		185			150	120		40
Base Capacity (vph)	426	1383		585	1671	890		208	571	452	635	689
Starvation Cap Reductn	0	0		0	498	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0

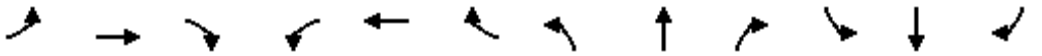
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.03	0.62		0.64	0.62	0.24		0.56	0.64	0.41	0.05	0.02

Intersection Summary	
Cycle Length: 90.5	
Actuated Cycle Length: 90.5	
Offset: 9.5 (10%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 20.2	Intersection LOS: C
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Grove Street/West Central Street & Route 140



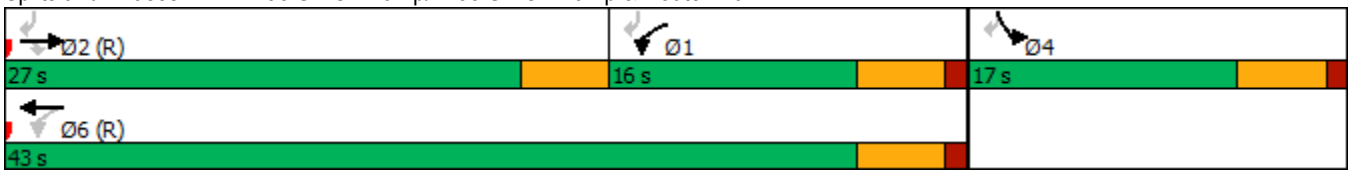


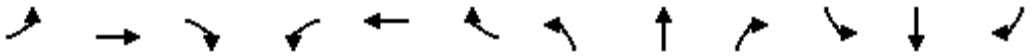
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	777	342	209	893	0	0	0	0	302	0	351
Future Volume (vph)	0	777	342	209	893	0	0	0	0	302	0	351
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3374	1649	3433	3406	0	0	0	0	3335	0	1649
Flt Permitted				0.283						0.950		
Satd. Flow (perm)	0	3374	1649	1023	3406	0	0	0	0	3335	0	1649
Satd. Flow (RTOR)			353									
Peak Hour Factor	0.97	0.97	0.97	0.96	0.96	0.96	0.25	0.25	0.25	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	11%	2%	6%	0%	0%	0%	0%	5%	0%	11%
Adj. Flow (vph)	0	801	353	218	930	0	0	0	0	328	0	382
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	801	353	218	930	0	0	0	0	328	0	382
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								2 1 4
Detector Phase		2	2	1	6					4		2 1 4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		
Minimum Split (s)		9.0	9.0	10.0	16.0					10.0		
Total Split (s)		27.0	27.0	16.0	43.0					17.0		
Total Split (%)		45.0%	45.0%	26.7%	71.7%					28.3%		
Maximum Green (s)		23.0	23.0	11.0	38.0					12.0		
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0		
All-Red Time (s)		0.0	0.0	1.0	1.0					1.0		
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		
Total Lost Time (s)		4.0	4.0	5.0	5.0					5.0		
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		
Recall Mode		C-Min	C-Min	None	C-Min					None		
Walk Time (s)					5.0							
Flash Dont Walk (s)					6.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)		27.4	27.4	38.5	38.5					11.5		60.0
Actuated g/C Ratio		0.46	0.46	0.64	0.64					0.19		1.00
v/c Ratio		0.52	0.37	0.23	0.43					0.51		0.23
Control Delay		14.0	3.0	6.5	6.4					24.3		0.3
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		14.0	3.0	6.5	6.4					24.3		0.3
LOS		B	A	A	A					C		A
Approach Delay		10.6			6.4						11.4	
Approach LOS		B			A						B	
Queue Length 50th (ft)		102	0	13	74					54		0
Queue Length 95th (ft)		172	44	26	122					84		0
Internal Link Dist (ft)		292			605			394			402	
Turn Bay Length (ft)				130								140

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1539	944	1164	2227					707		1625
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.52	0.37	0.19	0.42					0.46		0.24

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 4 (7%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 40	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 55.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-495 SB On Ramp/I-495 SB Off Ramp & Route 140



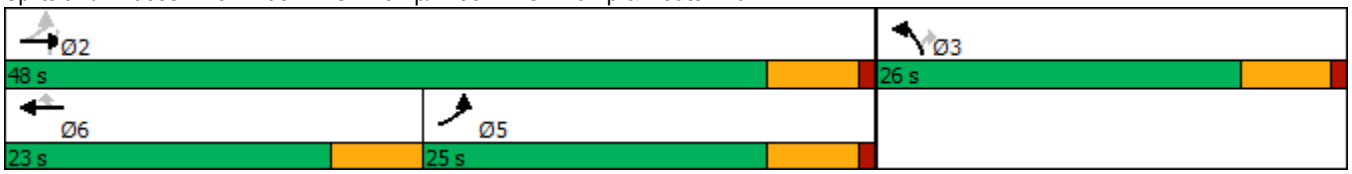


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	282	797	0	0	708	357	394	0	207	0	0	0
Future Volume (vph)	282	797	0	0	708	357	394	0	207	0	0	0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3099	3438	0	0	3539	1760	3155	0	1794	0	0	0
Flt Permitted	0.283						0.950					
Satd. Flow (perm)	923	3438	0	0	3539	1760	3155	0	1794	0	0	0
Satd. Flow (RTOR)						376						
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.96	0.96	0.96	0.25	0.25	0.25
Heavy Vehicles (%)	13%	5%	0%	0%	2%	4%	11%	0%	2%	0%	0%	0%
Adj. Flow (vph)	300	848	0	0	745	376	410	0	216	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	848	0	0	745	376	410	0	216	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		3					
Permitted Phases	2					6			2 3			
Detector Phase	5	2			6	6	3		2 3			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0					
Minimum Split (s)	11.0	11.0			19.0	19.0	11.0					
Total Split (s)	25.0	48.0			23.0	23.0	26.0					
Total Split (%)	33.8%	64.9%			31.1%	31.1%	35.1%					
Maximum Green (s)	19.0	42.0			18.0	18.0	20.0					
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0					
All-Red Time (s)	1.0	1.0			0.0	0.0	1.0					
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	6.0	6.0			5.0	5.0	6.0					
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0					
Recall Mode	None	Min			Min	Min	None					
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					7.0	7.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	29.0	29.0			17.0	17.0	12.4		53.6			
Actuated g/C Ratio	0.54	0.54			0.32	0.32	0.23		1.00			
v/c Ratio	0.38	0.46			0.67	0.46	0.56		0.12			
Control Delay	11.4	8.8			20.0	4.4	21.7		0.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	11.4	8.8			20.0	4.4	21.7		0.1			
LOS	B	A			B	A	C		A			
Approach Delay		9.5			14.8			14.3				
Approach LOS		A			B			B				
Queue Length 50th (ft)	21	73			101	0	60		0			
Queue Length 95th (ft)	45	135			186	53	102		0			
Internal Link Dist (ft)		605			1301			489			387	
Turn Bay Length (ft)	200					200			130			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	1490	2724			1202	846	1190		1772			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.20	0.31			0.62	0.44	0.34		0.12			

Intersection Summary	
Cycle Length: 74	
Actuated Cycle Length: 53.6	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 55.6%	ICU Level of Service B
Analysis Period (min) 15	

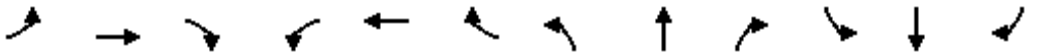
Splits and Phases: 3: I-495 NB Off Ramp/I-495 NB On Ramp & Route 140



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	94	99	273	105	97	264
Future Volume (Veh/h)	94	99	273	105	97	264
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.94	0.94	0.84	0.84
Hourly flow rate (vph)	106	111	290	112	115	314
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	890	346			402	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	890	346			402	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	84			90	
cM capacity (veh/h)	282	702			1162	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	217	402	429
Volume Left	106	0	115
Volume Right	111	112	0
cSH	407	1700	1162
Volume to Capacity	0.53	0.24	0.10
Queue Length 95th (ft)	76	0	8
Control Delay (s)	23.5	0.0	3.0
Lane LOS	C		A
Approach Delay (s)	23.5	0.0	3.0
Approach LOS	C		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	368	67	66	292	2	57	84	52	3	118	281
Future Volume (vph)	246	368	67	66	292	2	57	84	52	3	118	281
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977				0.850		0.964				0.850
Flt Protected	0.950			0.950				0.985			0.999	
Satd. Flow (prot)	1703	3233	0	1770	1949	1830	0	1810	0	0	1880	1636
Flt Permitted	0.367			0.476				0.985			0.999	
Satd. Flow (perm)	658	3233	0	887	1949	1830	0	1810	0	0	1880	1636
Satd. Flow (RTOR)		12				101		9				327
Peak Hour Factor	0.90	0.90	0.90	0.77	0.77	0.77	0.70	0.70	0.70	0.86	0.86	0.86
Heavy Vehicles (%)	6%	5%	8%	2%	4%	0%	7%	6%	6%	0%	1%	2%
Adj. Flow (vph)	273	409	74	86	379	3	81	120	74	3	137	327
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	483	0	86	379	3	0	275	0	0	140	327
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases	2			6		6						
Detector Phase	5	2		1	6	6	3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Total Split (s)	21.0	47.0		41.0	67.0	67.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.0%	29.0%		25.3%	41.4%	41.4%	15.4%	15.4%		15.4%	15.4%	
Maximum Green (s)	15.0	41.0		35.0	61.0	61.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.0			5.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	26.5	26.5		25.8	25.6	25.6		20.8			13.6	34.7
Actuated g/C Ratio	0.26	0.26		0.25	0.25	0.25		0.20			0.13	0.34
v/c Ratio	0.83	0.57		0.23	0.77	0.01		0.73			0.56	0.42
Control Delay	59.6	38.9		35.3	47.9	0.0		52.1			53.4	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	59.6	38.9		35.3	47.9	0.0		52.1			53.4	4.4
LOS	E	D		D	D	A		D			D	A
Approach Delay		46.4			45.2			52.1			19.1	
Approach LOS		D			D			D			B	
Queue Length 50th (ft)	157	140		41	212	0		150			79	0
Queue Length 95th (ft)	#386	275		89	349	0		#297			187	43
Internal Link Dist (ft)		1991			447			2470			1228	
Turn Bay Length (ft)	330			115		40						115

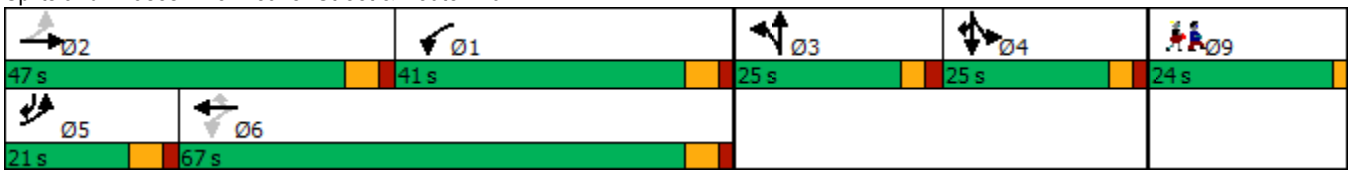
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	330	1359		678	1212	1177		376			383	771
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.83	0.36		0.13	0.31	0.00		0.73			0.37	0.42

Intersection Summary	
Cycle Length: 162	
Actuated Cycle Length: 101.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 40.4	Intersection LOS: D
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

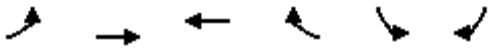
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Beaver Street & Route 140

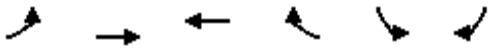


Lane Group	Ø9
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	313	651	225	107	35	55	
Future Volume (vph)	313	651	225	107	35	55	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.957			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1728	1766	1751	0	1694	1459	
Flt Permitted	0.376				0.950		
Satd. Flow (perm)	684	1766	1751	0	1694	1459	
Satd. Flow (RTOR)			30			56	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.98	0.98	
Heavy Vehicles (%)	1%	4%	7%	8%	3%	7%	
Adj. Flow (vph)	364	757	253	120	36	56	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	364	757	373	0	36	56	
Turn Type	pm+pt	NA	NA		Prot	pt+ov	
Protected Phases	7	4	8		6	6 7	9
Permitted Phases	4						
Detector Phase	7	4	8		6	6 7	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0		1.0
Minimum Split (s)	9.5	10.0	11.5		11.0		20.0
Total Split (s)	11.0	52.0	41.0		21.0		20.0
Total Split (%)	11.8%	55.9%	44.1%		22.6%		22%
Maximum Green (s)	8.0	47.0	36.0		15.0		18.0
Yellow Time (s)	3.0	3.5	3.5		3.0		2.0
All-Red Time (s)	0.0	1.5	1.5		3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	3.0	5.0	5.0		6.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0
Recall Mode	None	Min	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	28.6	26.6	15.3		6.8	18.1	
Actuated g/C Ratio	0.64	0.60	0.34		0.15	0.40	
v/c Ratio	0.58	0.72	0.60		0.14	0.09	
Control Delay	7.6	11.0	15.2		20.2	4.6	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	7.6	11.0	15.2		20.2	4.6	
LOS	A	B	B		C	A	
Approach Delay		9.9	15.2		10.7		
Approach LOS		A	B		B		
Queue Length 50th (ft)	31	108	67		8	0	
Queue Length 95th (ft)	61	200	130		32	19	
Internal Link Dist (ft)		1611	1575		8920		
Turn Bay Length (ft)	165				150		

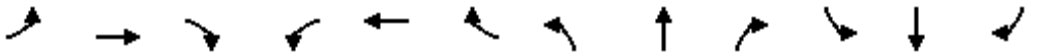


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	629	1697	1450		582	624	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.58	0.45	0.26		0.06	0.09	

Intersection Summary			
Cycle Length: 93			
Actuated Cycle Length: 44.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 52.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Washington Street & Grove Street

2023 Existing Weekday Evening Peak Hour



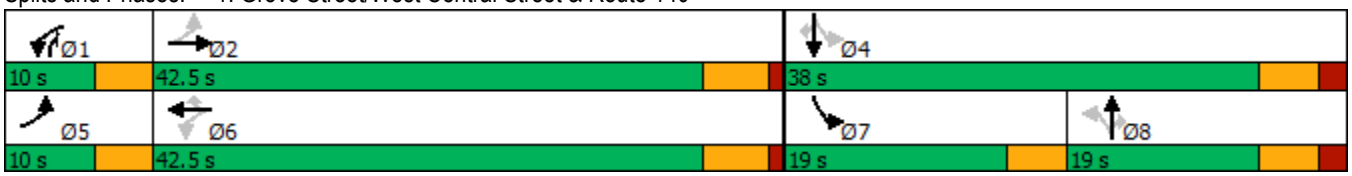
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	869	91	308	743	366	75	43	323	301	73	18
Future Volume (vph)	13	869	91	308	743	366	75	43	323	301	73	18
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1805	3465	0	3204	3231	1546	0	1807	1620	1728	1818	1777
Flt Permitted	0.321			0.109				0.757		0.499		
Satd. Flow (perm)	610	3465	0	368	3231	1546	0	1411	1620	907	1818	1777
Satd. Flow (RTOR)		15				385			90			78
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91	0.86	0.86	0.86
Heavy Vehicles (%)	0%	3%	0%	2%	8%	1%	3%	0%	3%	1%	1%	0%
Adj. Flow (vph)	15	988	103	324	782	385	82	47	355	350	85	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	1091	0	324	782	385	0	129	355	350	85	21
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.5		9.0	10.5	10.5	11.0	11.0	9.0	9.0	11.0	11.0
Total Split (s)	10.0	42.5		10.0	42.5	42.5	19.0	19.0	10.0	19.0	38.0	38.0
Total Split (%)	11.0%	47.0%		11.0%	47.0%	47.0%	21.0%	21.0%	11.0%	21.0%	42.0%	42.0%
Maximum Green (s)	6.0	37.0		6.0	37.0	37.0	13.0	13.0	6.0	15.0	32.0	32.0
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	2.0	2.0	0.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5		4.0	5.5	5.5		6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	None
Act Effct Green (s)	39.1	31.8		42.7	40.1	40.1		11.4	23.5	32.3	30.2	30.2
Actuated g/C Ratio	0.47	0.38		0.51	0.48	0.48		0.14	0.28	0.39	0.36	0.36
v/c Ratio	0.04	0.82		0.83	0.51	0.41		0.68	0.69	0.71	0.13	0.03
Control Delay	10.2	29.2		32.9	17.2	3.2		54.7	28.4	30.5	20.1	0.1
Queue Delay	0.0	0.0		0.0	0.8	0.4		0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	29.2		32.9	18.0	3.6		54.7	28.4	30.5	20.1	0.1
LOS	B	C		C	B	A		D	C	C	C	A
Approach Delay		28.9			17.5			35.4			27.1	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	4	272		46	141	0		68	130	147	31	0
Queue Length 95th (ft)	12	340		#121	238	53		#145	236	225	62	0
Internal Link Dist (ft)		637			292			3128			651	
Turn Bay Length (ft)	125			225		185			150	120		40
Base Capacity (vph)	373	1555		392	1592	957		221	518	497	702	734
Starvation Cap Reductn	0	0		0	477	210		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0

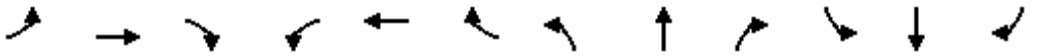
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.04	0.70		0.83	0.70	0.52		0.58	0.69	0.70	0.12	0.03

Intersection Summary	
Cycle Length: 90.5	
Actuated Cycle Length: 83.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 24.8	Intersection LOS: C
Intersection Capacity Utilization 76.5%	ICU Level of Service D
Analysis Period (min) 15	

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Grove Street/West Central Street & Route 140



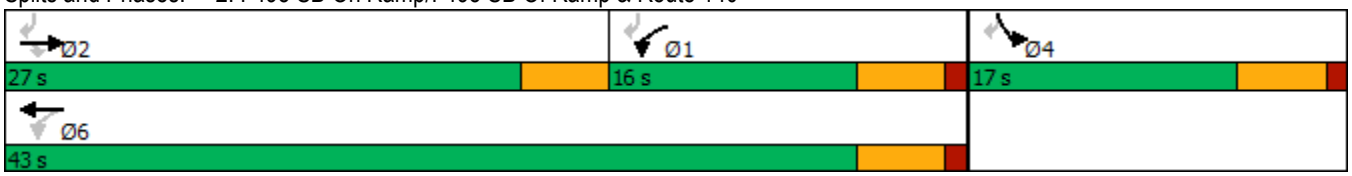


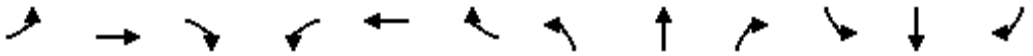
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	957	536	242	939	0	0	0	0	437	0	478
Future Volume (vph)	0	957	536	242	939	0	0	0	0	437	0	478
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1794	3433	3505	0	0	0	0	3433	0	1695
Flt Permitted				0.153						0.950		
Satd. Flow (perm)	0	3539	1794	553	3505	0	0	0	0	3433	0	1695
Satd. Flow (RTOR)			602									
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.25	0.25	0.25	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	2%	3%	0%	0%	0%	0%	2%	0%	8%
Adj. Flow (vph)	0	1075	602	266	1032	0	0	0	0	480	0	525
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1075	602	266	1032	0	0	0	0	480	0	525
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								2 1 4
Detector Phase		2	2	1	6					4		2 1 4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		
Minimum Split (s)		9.0	9.0	10.0	16.0					10.0		
Total Split (s)		27.0	27.0	16.0	43.0					17.0		
Total Split (%)		45.0%	45.0%	26.7%	71.7%					28.3%		
Maximum Green (s)		23.0	23.0	11.0	38.0					12.0		
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0		
All-Red Time (s)		0.0	0.0	1.0	1.0					1.0		
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		
Total Lost Time (s)		4.0	4.0	5.0	5.0					5.0		
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		
Recall Mode		Min	Min	None	Min					None		
Walk Time (s)					5.0							
Flash Dont Walk (s)					6.0							
Pedestrian Calls (#/hr)					2							
Act Effct Green (s)		22.7	22.7	34.8	34.8					11.4		56.3
Actuated g/C Ratio		0.40	0.40	0.62	0.62					0.20		1.00
v/c Ratio		0.75	0.56	0.35	0.48					0.69		0.31
Control Delay		19.1	3.6	10.9	6.7					27.0		0.5
Queue Delay		0.1	0.0	0.0	0.0					0.0		0.0
Total Delay		19.2	3.6	10.9	6.7					27.0		0.5
LOS		B	A	B	A					C		A
Approach Delay		13.6			7.6						13.1	
Approach LOS		B			A						B	
Queue Length 50th (ft)		159	0	16	85					78		0
Queue Length 95th (ft)		238	51	28	121					127		0
Internal Link Dist (ft)		292			605			394			402	
Turn Bay Length (ft)				130								140

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1450	1090	935	2373					734		1633
Starvation Cap Reductn		24	17	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.75	0.56	0.28	0.43					0.65		0.32

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.3	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: I-495 SB On Ramp/I-495 SB Of Ramp & Route 140



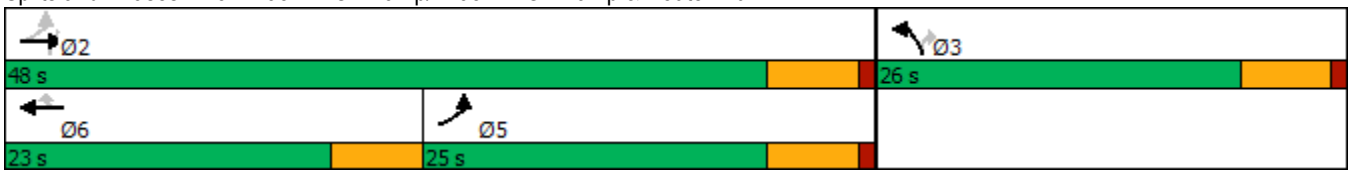


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	1041	0	0	862	409	319	0	289	0	0	0
Future Volume (vph)	353	1041	0	0	862	409	319	0	289	0	0	0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3367	3574	0	0	3539	1794	3273	0	1794	0	0	0
Flt Permitted	0.190						0.950					
Satd. Flow (perm)	673	3574	0	0	3539	1794	3273	0	1794	0	0	0
Satd. Flow (RTOR)						435						
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Heavy Vehicles (%)	4%	1%	0%	0%	2%	2%	7%	0%	2%	0%	0%	0%
Adj. Flow (vph)	368	1084	0	0	917	435	380	0	344	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	368	1084	0	0	917	435	380	0	344	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		3					
Permitted Phases	2					6			2 3			
Detector Phase	5	2			6	6	3		2 3			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0					
Minimum Split (s)	11.0	11.0			19.0	19.0	11.0					
Total Split (s)	25.0	48.0			23.0	23.0	26.0					
Total Split (%)	33.8%	64.9%			31.1%	31.1%	35.1%					
Maximum Green (s)	19.0	42.0			18.0	18.0	20.0					
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0					
All-Red Time (s)	1.0	1.0			0.0	0.0	1.0					
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	6.0	6.0			5.0	5.0	6.0					
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0					
Recall Mode	None	Min			Min	Min	None					
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					7.0	7.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	32.3	32.3			18.4	18.4	12.5		57.1			
Actuated g/C Ratio	0.57	0.57			0.32	0.32	0.22		1.00			
v/c Ratio	0.46	0.54			0.81	0.50	0.53		0.19			
Control Delay	14.5	9.2			27.4	4.8	23.0		0.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	14.5	9.2			27.4	4.8	23.0		0.2			
LOS	B	A			C	A	C		A			
Approach Delay		10.6			20.1			12.2				
Approach LOS		B			C			B				
Queue Length 50th (ft)	27	104			137	0	55		0			
Queue Length 95th (ft)	56	191			#355	65	103		0			
Internal Link Dist (ft)		605			1354			489			387	
Turn Bay Length (ft)	200					200			130			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	1419	2681			1137	872	1169		1769			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.26	0.40			0.81	0.50	0.33		0.19			

Intersection Summary	
Cycle Length: 74	
Actuated Cycle Length: 57.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 14.6	Intersection LOS: B
Intersection Capacity Utilization 64.2%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

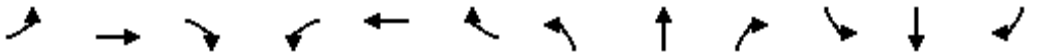
Splits and Phases: 3: I-495 NB Off Ramp/I-495 NB On Ramp & Route 140



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	121	84	290	118	100	325
Future Volume (Veh/h)	121	84	290	118	100	325
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.87	0.87	0.88	0.88
Hourly flow rate (vph)	155	108	333	136	114	369
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	998	401			469	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998	401			469	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	36	83			90	
cM capacity (veh/h)	242	653			1103	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	263	469	483
Volume Left	155	0	114
Volume Right	108	136	0
cSH	327	1700	1103
Volume to Capacity	0.80	0.28	0.10
Queue Length 95th (ft)	168	0	9
Control Delay (s)	49.0	0.0	2.9
Lane LOS	E		A
Approach Delay (s)	49.0	0.0	2.9
Approach LOS	E		

Intersection Summary			
Average Delay	11.8		
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	475	65	62	458	11	75	92	74	5	80	299
Future Volume (vph)	264	475	65	62	458	11	75	92	74	5	80	299
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982				0.850		0.958				0.850
Flt Protected	0.950			0.950				0.985			0.997	
Satd. Flow (prot)	1770	3368	0	1805	1968	1830	0	1899	0	0	1877	1652
Flt Permitted	0.231			0.431				0.985			0.997	
Satd. Flow (perm)	430	3368	0	819	1968	1830	0	1899	0	0	1877	1652
Satd. Flow (RTOR)		9				101		11				356
Peak Hour Factor	0.92	0.92	0.92	0.83	0.83	0.83	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	2%	2%	0%	0%	3%	0%	1%	1%	0%	0%	1%	1%
Adj. Flow (vph)	287	516	71	75	552	13	88	108	87	6	95	356
Shared Lane Traffic (%)												
Lane Group Flow (vph)	287	587	0	75	552	13	0	283	0	0	101	356
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases	2			6		6						
Detector Phase	5	2		1	6	6	3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Total Split (s)	21.0	47.0		41.0	67.0	67.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.0%	29.0%		25.3%	41.4%	41.4%	15.4%	15.4%		15.4%	15.4%	
Maximum Green (s)	15.0	41.0		35.0	61.0	61.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.0			5.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	33.0	33.0		37.3	37.3	37.3		20.9			12.6	33.8
Actuated g/C Ratio	0.29	0.29		0.33	0.33	0.33		0.19			0.11	0.30
v/c Ratio	0.92	0.59		0.16	0.85	0.02		0.79			0.48	0.48
Control Delay	74.6	41.0		30.4	48.8	0.1		60.8			59.4	5.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	74.6	41.0		30.4	48.8	0.1		60.8			59.4	5.4
LOS	E	D		C	D	A		E			E	A
Approach Delay		52.0			45.7			60.8			17.3	
Approach LOS		D			D			E			B	
Queue Length 50th (ft)	176	189		35	338	0		175			64	0
Queue Length 95th (ft)	#492	365		83	582	0		#495			154	44
Internal Link Dist (ft)		1904			667			2500			727	
Turn Bay Length (ft)	330			115		40						115

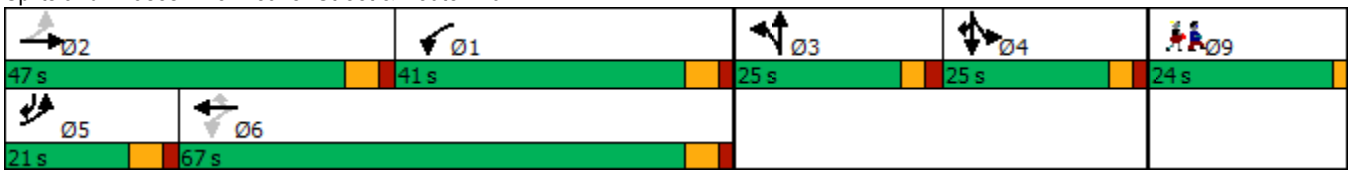
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	311	1310		659	1111	1078		360			347	744
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.92	0.45		0.11	0.50	0.01		0.79			0.29	0.48

Intersection Summary	
Cycle Length: 162	
Actuated Cycle Length: 112.8	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 44.3	Intersection LOS: D
Intersection Capacity Utilization 73.1%	ICU Level of Service D
Analysis Period (min) 15	

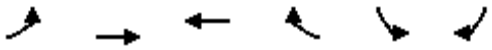
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Beaver Street & Route 140

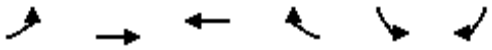


Lane Group	Ø9
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	124	370	668	68	97	355	
Future Volume (vph)	124	370	668	68	97	355	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.987			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1728	1801	1900	0	1678	1546	
Flt Permitted	0.138				0.950		
Satd. Flow (perm)	251	1801	1900	0	1678	1546	
Satd. Flow (RTOR)			6			422	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.81	0.81	
Heavy Vehicles (%)	1%	2%	2%	2%	4%	1%	
Adj. Flow (vph)	132	394	734	75	120	438	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	132	394	809	0	120	438	
Turn Type	pm+pt	NA	NA		Prot	pt+ov	
Protected Phases	7	4	8		6	6 7	9
Permitted Phases	4						
Detector Phase	7	4	8		6	6 7	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0		1.0
Minimum Split (s)	9.5	10.0	11.5		11.0		20.0
Total Split (s)	11.0	52.0	41.0		21.0		20.0
Total Split (%)	11.8%	55.9%	44.1%		22.6%		22%
Maximum Green (s)	8.0	47.0	36.0		15.0		18.0
Yellow Time (s)	3.0	3.5	3.5		3.0		2.0
All-Red Time (s)	0.0	1.5	1.5		3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	3.0	5.0	5.0		6.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0
Recall Mode	None	Min	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	48.8	46.8	36.1		10.3	21.0	
Actuated g/C Ratio	0.72	0.69	0.53		0.15	0.31	
v/c Ratio	0.38	0.32	0.80		0.47	0.57	
Control Delay	6.7	5.6	22.0		32.8	5.7	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.7	5.6	22.0		32.8	5.7	
LOS	A	A	C		C	A	
Approach Delay		5.8	22.0		11.5		
Approach LOS		A	C		B		
Queue Length 50th (ft)	13	53	253		47	5	
Queue Length 95th (ft)	35	113	#532		82	40	
Internal Link Dist (ft)		1611	1575		8920		
Turn Bay Length (ft)	165				150		

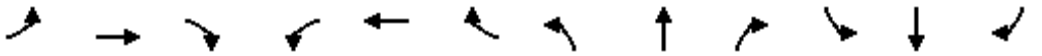


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	353	1244	1009		370	761	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.37	0.32	0.80		0.32	0.58	

Intersection Summary			
Cycle Length: 93			
Actuated Cycle Length: 68.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 70.4%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Washington Street & Grove Street

2030 No-Build Weekday Morning Peak Hour



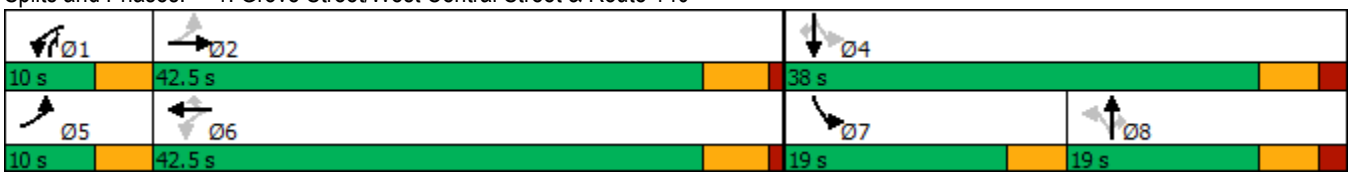
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	711	63	380	740	214	66	38	325	164	30	12
Future Volume (vph)	10	711	63	380	740	214	66	38	325	164	30	12
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1805	3196	0	3083	3172	1501	0	1784	1531	1711	1766	1777
Flt Permitted	0.339			0.172				0.786		0.465		
Satd. Flow (perm)	644	3196	0	558	3172	1501	0	1447	1531	837	1766	1777
Satd. Flow (RTOR)		12				225			171			78
Peak Hour Factor	0.84	0.84	0.84	0.95	0.95	0.95	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	12%	7%	6%	10%	4%	5%	0%	9%	2%	4%	0%
Adj. Flow (vph)	12	846	75	400	779	225	80	46	392	198	36	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	921	0	400	779	225	0	126	392	198	36	14
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.5		9.0	10.5	10.5	11.0	11.0	9.0	9.0	11.0	11.0
Total Split (s)	10.0	42.5		10.0	42.5	42.5	19.0	19.0	10.0	19.0	38.0	38.0
Total Split (%)	11.0%	47.0%		11.0%	47.0%	47.0%	21.0%	21.0%	11.0%	21.0%	42.0%	42.0%
Maximum Green (s)	6.0	37.0		6.0	37.0	37.0	13.0	13.0	6.0	15.0	32.0	32.0
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	2.0	2.0	0.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5		4.0	5.5	5.5		6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	None
Act Effct Green (s)	36.3	28.7		40.3	37.7	37.7		11.1	19.6	26.3	24.1	24.1
Actuated g/C Ratio	0.48	0.38		0.53	0.50	0.50		0.15	0.26	0.35	0.32	0.32
v/c Ratio	0.03	0.76		0.79	0.49	0.26		0.60	0.75	0.45	0.06	0.02
Control Delay	10.3	25.9		26.2	16.3	3.2		47.4	25.0	22.0	18.7	0.1
Queue Delay	0.0	0.0		0.0	0.3	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	25.9		26.2	16.6	3.2		47.4	25.0	22.0	18.7	0.1
LOS	B	C		C	B	A		D	C	C	B	A
Approach Delay		25.7			17.2			30.5			20.3	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	3	217		58	138	0		61	97	67	12	0
Queue Length 95th (ft)	10	263		#121	239	42		116	188	120	31	0
Internal Link Dist (ft)		637			292			3128			651	
Turn Bay Length (ft)	125			225		185			150	120		40
Base Capacity (vph)	409	1670		509	1731	921		264	522	498	795	843
Starvation Cap Reductn	0	0		0	378	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0

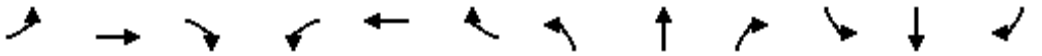
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.03	0.55		0.79	0.58	0.24		0.48	0.75	0.40	0.05	0.02

Intersection Summary	
Cycle Length: 90.5	
Actuated Cycle Length: 75.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 22.2	Intersection LOS: C
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Grove Street/West Central Street & Route 140



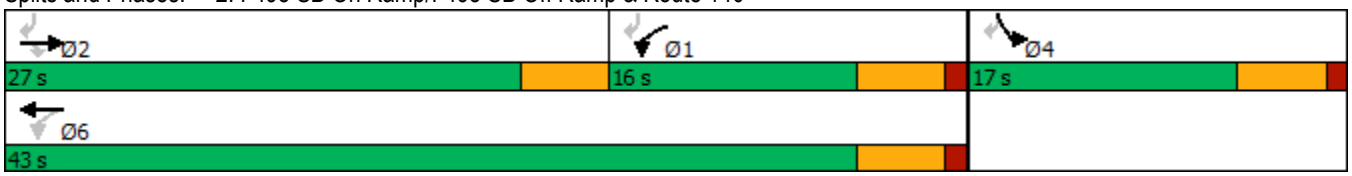


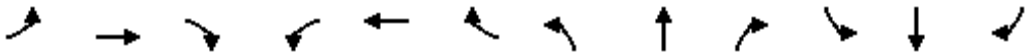
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	833	367	224	958	0	0	0	0	324	0	376
Future Volume (vph)	0	833	367	224	958	0	0	0	0	324	0	376
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3374	1649	3433	3406	0	0	0	0	3335	0	1649
Flt Permitted				0.240						0.950		
Satd. Flow (perm)	0	3374	1649	867	3406	0	0	0	0	3335	0	1649
Satd. Flow (RTOR)			378									
Peak Hour Factor	0.97	0.97	0.97	0.96	0.96	0.96	0.25	0.25	0.25	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	11%	2%	6%	0%	0%	0%	0%	5%	0%	11%
Adj. Flow (vph)	0	859	378	233	998	0	0	0	0	352	0	409
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	859	378	233	998	0	0	0	0	352	0	409
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								2 1 4
Detector Phase		2	2	1	6					4		2 1 4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		
Minimum Split (s)		9.0	9.0	10.0	16.0					10.0		
Total Split (s)		27.0	27.0	16.0	43.0					17.0		
Total Split (%)		45.0%	45.0%	26.7%	71.7%					28.3%		
Maximum Green (s)		23.0	23.0	11.0	38.0					12.0		
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0		
All-Red Time (s)		0.0	0.0	1.0	1.0					1.0		
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		
Total Lost Time (s)		4.0	4.0	5.0	5.0					5.0		
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		
Recall Mode		Min	Min	None	Min					None		
Walk Time (s)					5.0							
Flash Dont Walk (s)					6.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)		20.9	20.9	32.4	32.4					10.5		53.1
Actuated g/C Ratio		0.39	0.39	0.61	0.61					0.20		1.00
v/c Ratio		0.65	0.43	0.26	0.48					0.53		0.25
Control Delay		16.1	3.4	7.0	6.7					23.1		0.4
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		16.1	3.4	7.0	6.7					23.1		0.4
LOS		B	A	A	A					C		A
Approach Delay		12.2			6.8						10.9	
Approach LOS		B			A						B	
Queue Length 50th (ft)		112	0	14	82					53		0
Queue Length 95th (ft)		180	44	24	117					92		0
Internal Link Dist (ft)		292			605			394			402	
Turn Bay Length (ft)				130								140

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1484	937	1130	2475					765		1576
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.58	0.40	0.21	0.40					0.46		0.26

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.1	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-495 SB On Ramp/I-495 SB Off Ramp & Route 140





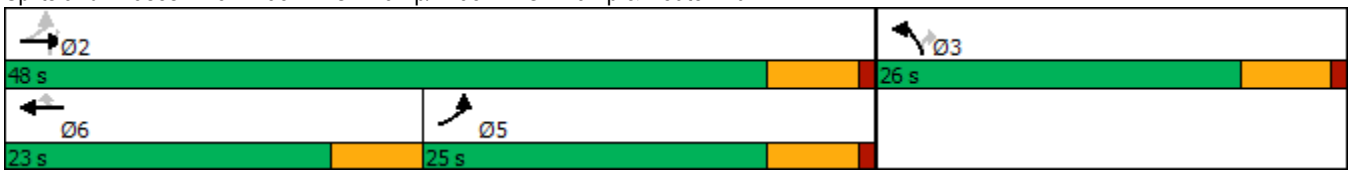
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	302	855	0	0	760	383	422	0	222	0	0	0
Future Volume (vph)	302	855	0	0	760	383	422	0	222	0	0	0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3099	3438	0	0	3539	1760	3155	0	1794	0	0	0
Flt Permitted	0.247						0.950					
Satd. Flow (perm)	806	3438	0	0	3539	1760	3155	0	1794	0	0	0
Satd. Flow (RTOR)						403						
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.96	0.96	0.96	0.25	0.25	0.25
Heavy Vehicles (%)	13%	5%	0%	0%	2%	4%	11%	0%	2%	0%	0%	0%
Adj. Flow (vph)	321	910	0	0	800	403	440	0	231	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	910	0	0	800	403	440	0	231	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		3					
Permitted Phases	2					6			2 3			
Detector Phase	5	2			6	6	3		2 3			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0					
Minimum Split (s)	11.0	11.0			19.0	19.0	11.0					
Total Split (s)	25.0	48.0			23.0	23.0	26.0					
Total Split (%)	33.8%	64.9%			31.1%	31.1%	35.1%					
Maximum Green (s)	19.0	42.0			18.0	18.0	20.0					
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0					
All-Red Time (s)	1.0	1.0			0.0	0.0	1.0					
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	6.0	6.0			5.0	5.0	6.0					
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0					
Recall Mode	None	Min			Min	Min	None					
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					7.0	7.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	30.5	30.5			17.7	17.7	13.4		56.0			
Actuated g/C Ratio	0.54	0.54			0.32	0.32	0.24		1.00			
v/c Ratio	0.43	0.49			0.71	0.48	0.59		0.13			
Control Delay	13.5	9.5			22.8	4.6	22.4		0.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	13.5	9.5			22.8	4.6	22.4		0.1			
LOS	B	A			C	A	C		A			
Approach Delay		10.5			16.7			14.7				
Approach LOS		B			B			B				
Queue Length 50th (ft)	23	84			116	0	66		0			
Queue Length 95th (ft)	52	161			#243	57	111		0			
Internal Link Dist (ft)		605			1301			489			387	
Turn Bay Length (ft)	200					200			130			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	1390	2605			1149	843	1138		1755			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.23	0.35			0.70	0.48	0.39		0.13			

Intersection Summary	
Cycle Length: 74	
Actuated Cycle Length: 56	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

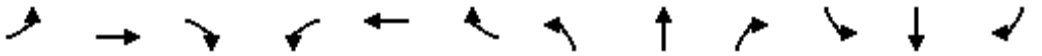
Splits and Phases: 3: I-495 NB Off Ramp/I-495 NB On Ramp & Route 140



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	101	106	293	113	104	283
Future Volume (Veh/h)	101	106	293	113	104	283
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.94	0.94	0.84	0.84
Hourly flow rate (vph)	113	119	312	120	124	337
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	957	372			432	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	957	372			432	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	82			89	
cM capacity (veh/h)	255	678			1133	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	232	432	461
Volume Left	113	0	124
Volume Right	119	120	0
cSH	375	1700	1133
Volume to Capacity	0.62	0.25	0.11
Queue Length 95th (ft)	100	0	9
Control Delay (s)	29.0	0.0	3.2
Lane LOS	D		A
Approach Delay (s)	29.0	0.0	3.2
Approach LOS	D		

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	395	72	71	313	2	61	90	56	3	127	301
Future Volume (vph)	264	395	72	71	313	2	61	90	56	3	127	301
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977				0.850		0.964				0.850
Flt Protected	0.950			0.950				0.986			0.999	
Satd. Flow (prot)	1703	3233	0	1770	1949	1830	0	1812	0	0	1880	1636
Flt Permitted	0.615			0.615				0.986			0.999	
Satd. Flow (perm)	1102	3233	0	1146	1949	1830	0	1812	0	0	1880	1636
Satd. Flow (RTOR)		12				101		9				350
Peak Hour Factor	0.90	0.90	0.90	0.77	0.77	0.77	0.70	0.70	0.70	0.86	0.86	0.86
Heavy Vehicles (%)	6%	5%	8%	2%	4%	0%	7%	6%	6%	0%	1%	2%
Adj. Flow (vph)	293	439	80	92	406	3	87	129	80	3	148	350
Shared Lane Traffic (%)												
Lane Group Flow (vph)	293	519	0	92	406	3	0	296	0	0	151	350
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases	2			6		6						
Detector Phase	5	2		1	6	6	3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Total Split (s)	21.0	47.0		41.0	67.0	67.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.0%	29.0%		25.3%	41.4%	41.4%	15.4%	15.4%		15.4%	15.4%	
Maximum Green (s)	15.0	41.0		35.0	61.0	61.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.0			5.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	22.1	22.1		27.5	27.5	27.5		20.7			14.2	35.3
Actuated g/C Ratio	0.21	0.21		0.26	0.26	0.26		0.20			0.14	0.34
v/c Ratio	0.91	0.75		0.22	0.79	0.01		0.81			0.59	0.45
Control Delay	72.2	46.0		33.8	48.6	0.0		58.7			55.4	4.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	72.2	46.0		33.8	48.6	0.0		58.7			55.4	4.5
LOS	E	D		C	D	A		E			E	A
Approach Delay		55.5			45.6			58.7			19.9	
Approach LOS		E			D			E			B	
Queue Length 50th (ft)	174	155		44	233	0		170			88	0
Queue Length 95th (ft)	#453	298		93	375	0		#344			203	46
Internal Link Dist (ft)		1991			447			2470			1228	
Turn Bay Length (ft)	330			115		40						115

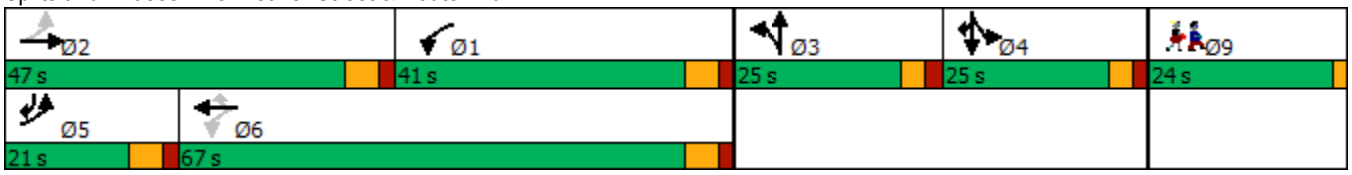
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	323	1326		689	1183	1150		367			374	780
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.91	0.39		0.13	0.34	0.00		0.81			0.40	0.45

Intersection Summary	
Cycle Length: 162	
Actuated Cycle Length: 104.2	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 45.1	Intersection LOS: D
Intersection Capacity Utilization 67.8%	ICU Level of Service C
Analysis Period (min) 15	

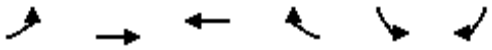
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Beaver Street & Route 140

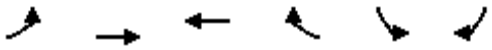


Lane Group	Ø9
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	336	698	241	115	38	59	
Future Volume (vph)	336	698	241	115	38	59	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.956			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1728	1766	1749	0	1694	1459	
Flt Permitted	0.377				0.950		
Satd. Flow (perm)	686	1766	1749	0	1694	1459	
Satd. Flow (RTOR)			30			60	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.98	0.98	
Heavy Vehicles (%)	1%	4%	7%	8%	3%	7%	
Adj. Flow (vph)	391	812	271	129	39	60	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	391	812	400	0	39	60	
Turn Type	pm+pt	NA	NA		Prot	pt+ov	
Protected Phases	7	4	8		6	6 7	9
Permitted Phases	4						
Detector Phase	7	4	8		6	6 7	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0		1.0
Minimum Split (s)	9.5	10.0	11.5		11.0		20.0
Total Split (s)	11.0	52.0	41.0		21.0		20.0
Total Split (%)	11.8%	55.9%	44.1%		22.6%		22%
Maximum Green (s)	8.0	47.0	36.0		15.0		18.0
Yellow Time (s)	3.0	3.5	3.5		3.0		2.0
All-Red Time (s)	0.0	1.5	1.5		3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	3.0	5.0	5.0		6.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0
Recall Mode	None	Min	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	32.7	30.6	19.3		7.0	18.4	
Actuated g/C Ratio	0.67	0.62	0.39		0.14	0.38	
v/c Ratio	0.62	0.74	0.57		0.16	0.10	
Control Delay	8.0	11.0	13.5		23.3	5.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	8.0	11.0	13.5		23.3	5.4	
LOS	A	B	B		C	A	
Approach Delay		10.0	13.5		12.4		
Approach LOS		B	B		B		
Queue Length 50th (ft)	35	125	75		10	0	
Queue Length 95th (ft)	66	223	140		37	22	
Internal Link Dist (ft)		1611	1575		8920		
Turn Bay Length (ft)	165				150		

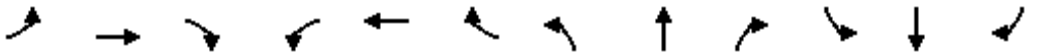


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	633	1622	1334		535	584	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.50	0.30		0.07	0.10	

Intersection Summary			
Cycle Length: 93			
Actuated Cycle Length: 49			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 55.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Washington Street & Grove Street

2030 No-Build Weekday Evening Peak Hour



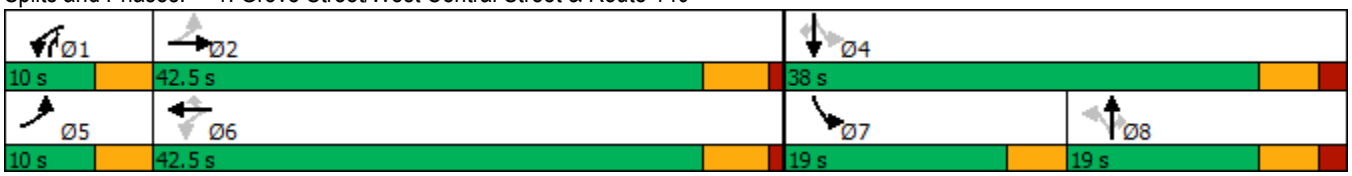
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	932	98	330	797	392	80	46	346	323	78	19
Future Volume (vph)	14	932	98	330	797	392	80	46	346	323	78	19
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1805	3465	0	3204	3231	1546	0	1807	1620	1728	1818	1777
Flt Permitted	0.290			0.097				0.754		0.478		
Satd. Flow (perm)	551	3465	0	327	3231	1546	0	1406	1620	869	1818	1777
Satd. Flow (RTOR)		15				413			78			78
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91	0.86	0.86	0.86
Heavy Vehicles (%)	0%	3%	0%	2%	8%	1%	3%	0%	3%	1%	1%	0%
Adj. Flow (vph)	16	1059	111	347	839	413	88	51	380	376	91	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1170	0	347	839	413	0	139	380	376	91	22
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.5		9.0	10.5	10.5	11.0	11.0	9.0	9.0	11.0	11.0
Total Split (s)	10.0	42.5		10.0	42.5	42.5	19.0	19.0	10.0	19.0	38.0	38.0
Total Split (%)	11.0%	47.0%		11.0%	47.0%	47.0%	21.0%	21.0%	11.0%	21.0%	42.0%	42.0%
Maximum Green (s)	6.0	37.0		6.0	37.0	37.0	13.0	13.0	6.0	15.0	32.0	32.0
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	2.0	2.0	0.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5		4.0	5.5	5.5		6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	None
Act Effct Green (s)	41.1	33.8		44.6	42.0	42.0		11.7	23.8	32.8	30.8	30.8
Actuated g/C Ratio	0.48	0.39		0.52	0.49	0.49		0.14	0.28	0.38	0.36	0.36
v/c Ratio	0.05	0.86		0.94	0.53	0.43		0.73	0.76	0.78	0.14	0.03
Control Delay	10.3	31.1		52.2	17.7	3.2		59.8	34.2	35.8	20.5	0.1
Queue Delay	0.0	0.0		0.0	1.3	0.5		0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	31.1		52.2	18.9	3.7		59.8	34.2	35.8	20.5	0.1
LOS	B	C		D	B	A		E	C	D	C	A
Approach Delay		30.8			22.2			41.1			31.4	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	4	302		53	155	0		77	159	169	35	0
Queue Length 95th (ft)	13	375		#148	261	55		#161	#292	#266	65	0
Internal Link Dist (ft)		637			292			3128			651	
Turn Bay Length (ft)	125			225		185			150	120		40
Base Capacity (vph)	352	1502		370	1584	968		212	503	480	677	711
Starvation Cap Reductn	0	0		0	496	219		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0

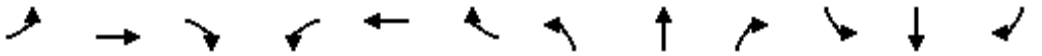
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.78		0.94	0.77	0.55		0.66	0.76	0.78	0.13	0.03

Intersection Summary	
Cycle Length: 90.5	
Actuated Cycle Length: 86.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Grove Street/West Central Street & Route 140



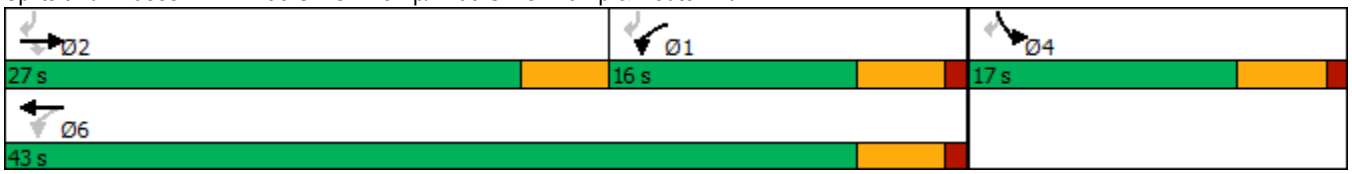


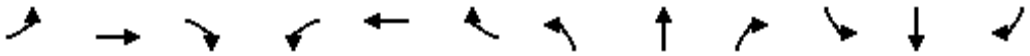
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1026	575	259	1007	0	0	0	0	469	0	512
Future Volume (vph)	0	1026	575	259	1007	0	0	0	0	469	0	512
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1794	3433	3505	0	0	0	0	3433	0	1695
Flt Permitted				0.148						0.950		
Satd. Flow (perm)	0	3539	1794	535	3505	0	0	0	0	3433	0	1695
Satd. Flow (RTOR)			646									
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.25	0.25	0.25	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	2%	3%	0%	0%	0%	0%	2%	0%	8%
Adj. Flow (vph)	0	1153	646	285	1107	0	0	0	0	515	0	563
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1153	646	285	1107	0	0	0	0	515	0	563
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								2 1 4
Detector Phase		2	2	1	6					4		2 1 4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		
Minimum Split (s)		9.0	9.0	10.0	16.0					10.0		
Total Split (s)		27.0	27.0	16.0	43.0					17.0		
Total Split (%)		45.0%	45.0%	26.7%	71.7%					28.3%		
Maximum Green (s)		23.0	23.0	11.0	38.0					12.0		
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0		
All-Red Time (s)		0.0	0.0	1.0	1.0					1.0		
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		
Total Lost Time (s)		4.0	4.0	5.0	5.0					5.0		
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		
Recall Mode		Min	Min	None	Min					None		
Walk Time (s)					5.0							
Flash Dont Walk (s)					6.0							
Pedestrian Calls (#/hr)					2							
Act Effct Green (s)		23.0	23.0	35.5	35.5					11.6		57.1
Actuated g/C Ratio		0.40	0.40	0.62	0.62					0.20		1.00
v/c Ratio		0.81	0.58	0.37	0.51					0.74		0.33
Control Delay		21.7	3.8	11.7	7.0					29.7		0.5
Queue Delay		0.2	0.0	0.0	0.0					0.0		0.0
Total Delay		21.8	3.8	11.7	7.0					29.7		0.5
LOS		C	A	B	A					C		A
Approach Delay		15.4			7.9						14.4	
Approach LOS		B			A						B	
Queue Length 50th (ft)		177	0	18	94					85		0
Queue Length 95th (ft)		#300	53	29	133					#152		0
Internal Link Dist (ft)		292			605			394			402	
Turn Bay Length (ft)				130								140

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1427	1109	915	2334					722		1657
Starvation Cap Reductn		23	16	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.82	0.59	0.31	0.47					0.71		0.34

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 68.0%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: I-495 SB On Ramp/I-495 SB Of Ramp & Route 140



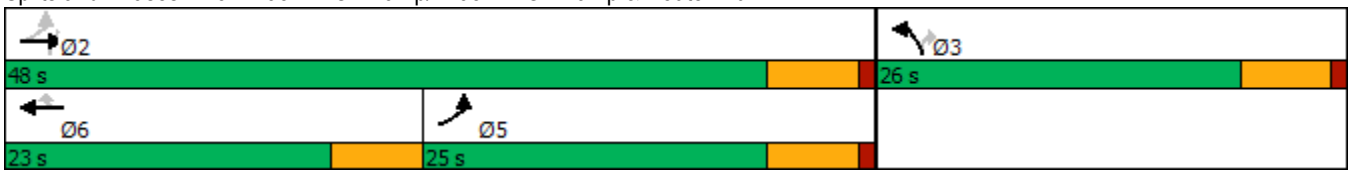


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	1117	0	0	924	439	342	0	310	0	0	0
Future Volume (vph)	378	1117	0	0	924	439	342	0	310	0	0	0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3367	3574	0	0	3539	1794	3273	0	1794	0	0	0
Flt Permitted	0.171						0.950					
Satd. Flow (perm)	606	3574	0	0	3539	1794	3273	0	1794	0	0	0
Satd. Flow (RTOR)						467						
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Heavy Vehicles (%)	4%	1%	0%	0%	2%	2%	7%	0%	2%	0%	0%	0%
Adj. Flow (vph)	394	1164	0	0	983	467	407	0	369	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	394	1164	0	0	983	467	407	0	369	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		3					
Permitted Phases	2					6			2 3			
Detector Phase	5	2			6	6	3		2 3			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0					
Minimum Split (s)	11.0	11.0			19.0	19.0	11.0					
Total Split (s)	25.0	48.0			23.0	23.0	26.0					
Total Split (%)	33.8%	64.9%			31.1%	31.1%	35.1%					
Maximum Green (s)	19.0	42.0			18.0	18.0	20.0					
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0					
All-Red Time (s)	1.0	1.0			0.0	0.0	1.0					
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	6.0	6.0			5.0	5.0	6.0					
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0					
Recall Mode	None	Min			Min	Min	None					
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					7.0	7.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	33.1	33.1			18.4	18.4	13.2		58.5			
Actuated g/C Ratio	0.57	0.57			0.31	0.31	0.23		1.00			
v/c Ratio	0.50	0.58			0.88	0.53	0.55		0.21			
Control Delay	16.2	10.0			33.6	5.0	23.6		0.3			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	16.2	10.0			33.6	5.0	23.6		0.3			
LOS	B	A			C	A	C		A			
Approach Delay		11.5			24.4			12.5				
Approach LOS		B			C			B				
Queue Length 50th (ft)	29	120			156	0	60		0			
Queue Length 95th (ft)	61	217			#396	68	110		0			
Internal Link Dist (ft)		605			1354			489			387	
Turn Bay Length (ft)	200					200			130			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	1359	2620			1112	883	1142		1758			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.29	0.44			0.88	0.53	0.36		0.21			

Intersection Summary			
Cycle Length: 74			
Actuated Cycle Length: 58.5			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 68.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

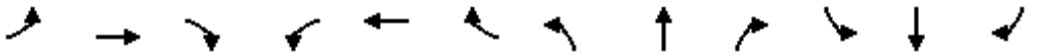
Splits and Phases: 3: I-495 NB Off Ramp/I-495 NB On Ramp & Route 140



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	130	90	311	127	107	348
Future Volume (Veh/h)	130	90	311	127	107	348
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.87	0.87	0.88	0.88
Hourly flow rate (vph)	167	115	357	146	122	395
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	1069	430			503	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1069	430			503	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	23	82			89	
cM capacity (veh/h)	217	629			1072	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	282	503	517
Volume Left	167	0	122
Volume Right	115	146	0
cSH	296	1700	1072
Volume to Capacity	0.95	0.30	0.11
Queue Length 95th (ft)	236	0	10
Control Delay (s)	79.2	0.0	3.1
Lane LOS	F		A
Approach Delay (s)	79.2	0.0	3.1
Approach LOS	F		

Intersection Summary			
Average Delay	18.4		
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	509	70	66	491	12	80	99	79	5	86	321
Future Volume (vph)	283	509	70	66	491	12	80	99	79	5	86	321
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982				0.850		0.959				0.850
Flt Protected	0.950			0.950				0.985			0.997	
Satd. Flow (prot)	1770	3368	0	1805	1968	1830	0	1901	0	0	1877	1652
Flt Permitted	0.205			0.413				0.985			0.997	
Satd. Flow (perm)	382	3368	0	785	1968	1830	0	1901	0	0	1877	1652
Satd. Flow (RTOR)		9				101		11				382
Peak Hour Factor	0.92	0.92	0.92	0.83	0.83	0.83	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	2%	2%	0%	0%	3%	0%	1%	1%	0%	0%	1%	1%
Adj. Flow (vph)	308	553	76	80	592	14	94	116	93	6	102	382
Shared Lane Traffic (%)												
Lane Group Flow (vph)	308	629	0	80	592	14	0	303	0	0	108	382
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases	2			6		6						
Detector Phase	5	2		1	6	6	3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Total Split (s)	21.0	47.0		41.0	67.0	67.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.0%	29.0%		25.3%	41.4%	41.4%	15.4%	15.4%		15.4%	15.4%	
Maximum Green (s)	15.0	41.0		35.0	61.0	61.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.0			5.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	35.2	35.2		40.1	40.1	40.1		20.8			13.1	34.2
Actuated g/C Ratio	0.30	0.30		0.35	0.35	0.35		0.18			0.11	0.30
v/c Ratio	1.02	0.61		0.17	0.87	0.02		0.87			0.51	0.50
Control Delay	96.8	41.7		30.4	50.7	0.1		70.6			61.3	5.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	96.8	41.7		30.4	50.7	0.1		70.6			61.3	5.5
LOS	F	D		C	D	A		E			E	A
Approach Delay		59.8			47.3			70.6			17.8	
Approach LOS		E			D			E			B	
Queue Length 50th (ft)	~208	210		37	378	0		199			71	0
Queue Length 95th (ft)	#567	394		88	637	0		#541			164	44
Internal Link Dist (ft)		1904			667			2500			727	
Turn Bay Length (ft)	330			115		40						115

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

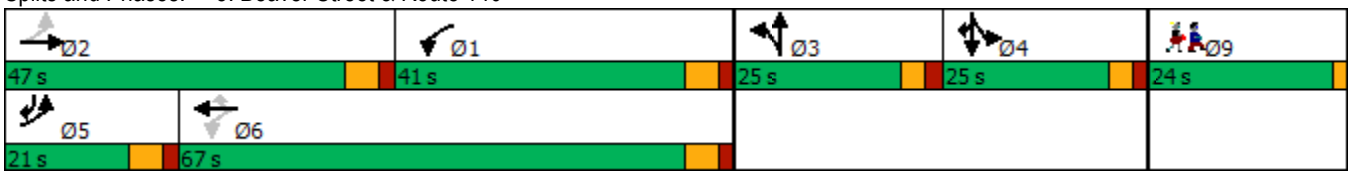
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	302	1286		650	1077	1047		350			336	756
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	1.02	0.49		0.12	0.55	0.01		0.87			0.32	0.51

Intersection Summary	
Cycle Length: 162	
Actuated Cycle Length: 115.9	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 49.1	Intersection LOS: D
Intersection Capacity Utilization 76.8%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

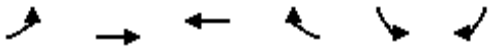
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Beaver Street & Route 140

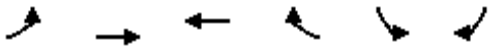


Lane Group	Ø9
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	133	397	716	73	104	381	
Future Volume (vph)	133	397	716	73	104	381	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.988			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1728	1801	1902	0	1678	1546	
Flt Permitted	0.102				0.950		
Satd. Flow (perm)	185	1801	1902	0	1678	1546	
Satd. Flow (RTOR)			6			412	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.81	0.81	
Heavy Vehicles (%)	1%	2%	2%	2%	4%	1%	
Adj. Flow (vph)	141	422	787	80	128	470	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	141	422	867	0	128	470	
Turn Type	pm+pt	NA	NA		Prot	pt+ov	
Protected Phases	7	4	8		6	6 7	9
Permitted Phases	4						
Detector Phase	7	4	8		6	6 7	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0		1.0
Minimum Split (s)	9.5	10.0	11.5		11.0		20.0
Total Split (s)	11.0	52.0	41.0		21.0		20.0
Total Split (%)	11.8%	55.9%	44.1%		22.6%		22%
Maximum Green (s)	8.0	47.0	36.0		15.0		18.0
Yellow Time (s)	3.0	3.5	3.5		3.0		2.0
All-Red Time (s)	0.0	1.5	1.5		3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	3.0	5.0	5.0		6.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0
Recall Mode	None	Min	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	48.9	46.9	36.1		10.5	21.3	
Actuated g/C Ratio	0.71	0.69	0.53		0.15	0.31	
v/c Ratio	0.46	0.34	0.86		0.50	0.61	
Control Delay	11.0	5.8	26.2		33.3	7.3	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	11.0	5.8	26.2		33.3	7.3	
LOS	B	A	C		C	A	
Approach Delay		7.1	26.2		12.9		
Approach LOS		A	C		B		
Queue Length 50th (ft)	14	59	290		50	17	
Queue Length 95th (ft)	58	123	#593		87	55	
Internal Link Dist (ft)		1611	1575		8920		
Turn Bay Length (ft)	165				150		

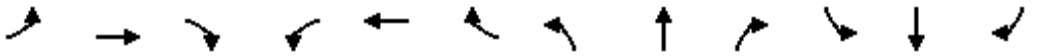


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	312	1239	1005		368	754	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.45	0.34	0.86		0.35	0.62	

Intersection Summary			
Cycle Length: 93			
Actuated Cycle Length: 68.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 17.0		Intersection LOS: B	
Intersection Capacity Utilization 74.9%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Washington Street & Grove Street

2030 Build Weekday Morning Peak Hour



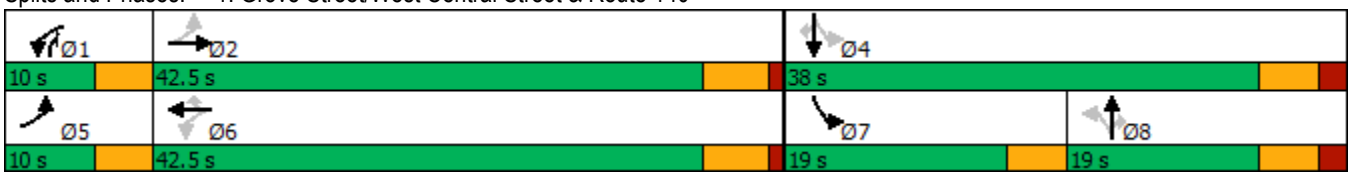
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	711	65	398	740	214	71	38	386	164	30	12
Future Volume (vph)	10	711	65	398	740	214	71	38	386	164	30	12
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.968		0.950		
Satd. Flow (prot)	1805	3193	0	3083	3172	1501	0	1781	1545	1711	1766	1777
Flt Permitted	0.329			0.163				0.781		0.497		
Satd. Flow (perm)	625	3193	0	529	3172	1501	0	1437	1545	895	1766	1777
Satd. Flow (RTOR)		13				225			174			78
Peak Hour Factor	0.84	0.84	0.84	0.95	0.95	0.95	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	12%	7%	6%	10%	4%	5%	0%	8%	2%	4%	0%
Adj. Flow (vph)	12	846	77	419	779	225	86	46	465	198	36	14
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	923	0	419	779	225	0	132	465	198	36	14
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.5		9.0	10.5	10.5	11.0	11.0	9.0	9.0	11.0	11.0
Total Split (s)	10.0	42.5		10.0	42.5	42.5	19.0	19.0	10.0	19.0	38.0	38.0
Total Split (%)	11.0%	47.0%		11.0%	47.0%	47.0%	21.0%	21.0%	11.0%	21.0%	42.0%	42.0%
Maximum Green (s)	6.0	37.0		6.0	37.0	37.0	13.0	13.0	6.0	15.0	32.0	32.0
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	2.0	2.0	0.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5		4.0	5.5	5.5		6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	None
Act Effct Green (s)	35.8	28.4		39.5	36.9	36.9		11.2	23.5	30.3	28.2	28.2
Actuated g/C Ratio	0.45	0.36		0.50	0.47	0.47		0.14	0.30	0.39	0.36	0.36
v/c Ratio	0.03	0.80		0.90	0.52	0.27		0.65	0.80	0.42	0.06	0.02
Control Delay	10.3	28.1		39.7	17.2	3.3		50.3	29.2	21.1	18.6	0.1
Queue Delay	0.0	0.0		0.0	0.4	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	28.1		39.7	17.7	3.3		50.3	29.2	21.1	18.6	0.1
LOS	B	C		D	B	A		D	C	C	B	A
Approach Delay		27.8			21.9			33.9			19.5	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	3	221		62	141	0		65	140	67	12	0
Queue Length 95th (ft)	10	264		#137	239	42		#122	#277	120	31	0
Internal Link Dist (ft)		637			292			3128			651	
Turn Bay Length (ft)	125			225		185			150	120		40
Base Capacity (vph)	378	1545		465	1609	872		243	583	503	736	786
Starvation Cap Reductn	0	0		0	378	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0

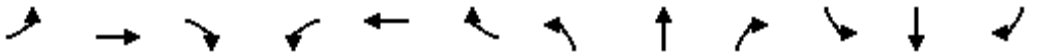
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.03	0.60		0.90	0.63	0.26		0.54	0.80	0.39	0.05	0.02

Intersection Summary		
Cycle Length: 90.5		
Actuated Cycle Length: 78.7		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 25.7	Intersection LOS: C	
Intersection Capacity Utilization 67.6%	ICU Level of Service C	
Analysis Period (min) 15		

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Grove Street/West Central Street & Route 140



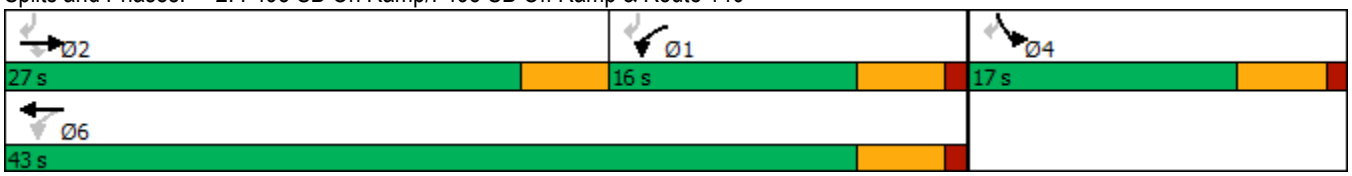


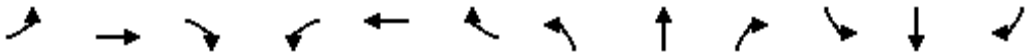
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	867	394	224	966	0	0	0	0	324	0	386
Future Volume (vph)	0	867	394	224	966	0	0	0	0	324	0	386
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3374	1664	3433	3406	0	0	0	0	3335	0	1649
Flt Permitted				0.227						0.950		
Satd. Flow (perm)	0	3374	1664	820	3406	0	0	0	0	3335	0	1649
Satd. Flow (RTOR)			406									
Peak Hour Factor	0.97	0.97	0.97	0.96	0.96	0.96	0.25	0.25	0.25	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	10%	2%	6%	0%	0%	0%	0%	5%	0%	11%
Adj. Flow (vph)	0	894	406	233	1006	0	0	0	0	352	0	420
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	894	406	233	1006	0	0	0	0	352	0	420
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								2 1 4
Detector Phase		2	2	1	6					4		2 1 4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		
Minimum Split (s)		9.0	9.0	10.0	16.0					10.0		
Total Split (s)		27.0	27.0	16.0	43.0					17.0		
Total Split (%)		45.0%	45.0%	26.7%	71.7%					28.3%		
Maximum Green (s)		23.0	23.0	11.0	38.0					12.0		
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0		
All-Red Time (s)		0.0	0.0	1.0	1.0					1.0		
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		
Total Lost Time (s)		4.0	4.0	5.0	5.0					5.0		
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		
Recall Mode		Min	Min	None	Min					None		
Walk Time (s)					5.0							
Flash Dont Walk (s)					6.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)		21.5	21.5	33.0	33.0					10.5		53.7
Actuated g/C Ratio		0.40	0.40	0.61	0.61					0.20		1.00
v/c Ratio		0.66	0.45	0.27	0.48					0.54		0.25
Control Delay		16.3	3.4	7.2	6.7					23.4		0.4
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		16.3	3.4	7.2	6.7					23.4		0.4
LOS		B	A	A	A					C		A
Approach Delay		12.3			6.8						10.9	
Approach LOS		B			A						B	
Queue Length 50th (ft)		118	0	14	83					53		0
Queue Length 95th (ft)		191	45	24	119					93		0
Internal Link Dist (ft)		292			605			394			402	
Turn Bay Length (ft)				130								140

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1462	951	1102	2439					754		1592
Starvation Cap Reductn		0	0	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.61	0.43	0.21	0.41					0.47		0.26

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.7	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 9.9	Intersection LOS: A
Intersection Capacity Utilization 59.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: I-495 SB On Ramp/I-495 SB Off Ramp & Route 140



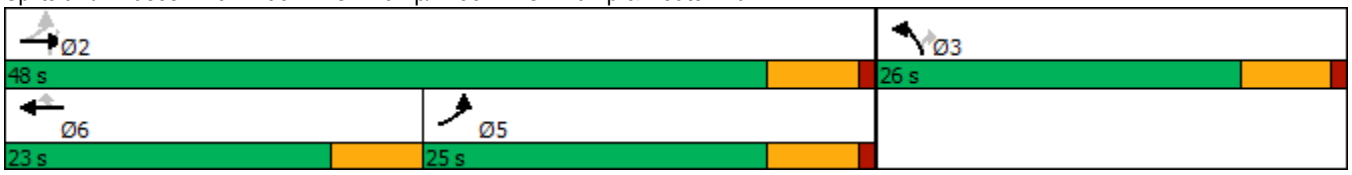


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	855	0	0	760	383	430	0	222	0	0	0
Future Volume (vph)	336	855	0	0	760	383	430	0	222	0	0	0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3127	3438	0	0	3539	1760	3155	0	1794	0	0	0
Flt Permitted	0.244						0.950					
Satd. Flow (perm)	803	3438	0	0	3539	1760	3155	0	1794	0	0	0
Satd. Flow (RTOR)						403						
Peak Hour Factor	0.94	0.94	0.94	0.95	0.95	0.95	0.96	0.96	0.96	0.25	0.25	0.25
Heavy Vehicles (%)	12%	5%	0%	0%	2%	4%	11%	0%	2%	0%	0%	0%
Adj. Flow (vph)	357	910	0	0	800	403	448	0	231	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	357	910	0	0	800	403	448	0	231	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		3					
Permitted Phases	2					6			2 3			
Detector Phase	5	2			6	6	3		2 3			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0					
Minimum Split (s)	11.0	11.0			19.0	19.0	11.0					
Total Split (s)	25.0	48.0			23.0	23.0	26.0					
Total Split (%)	33.8%	64.9%			31.1%	31.1%	35.1%					
Maximum Green (s)	19.0	42.0			18.0	18.0	20.0					
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0					
All-Red Time (s)	1.0	1.0			0.0	0.0	1.0					
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	6.0	6.0			5.0	5.0	6.0					
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0					
Recall Mode	None	Min			Min	Min	None					
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					7.0	7.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	31.2	31.2			17.8	17.8	13.6		56.9			
Actuated g/C Ratio	0.55	0.55			0.31	0.31	0.24		1.00			
v/c Ratio	0.46	0.48			0.72	0.49	0.59		0.13			
Control Delay	14.3	9.5			23.7	4.7	22.9		0.1			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	14.3	9.5			23.7	4.7	22.9		0.1			
LOS	B	A			C	A	C		A			
Approach Delay		10.8			17.3			15.1				
Approach LOS		B			B			B				
Queue Length 50th (ft)	27	85			120	0	68		0			
Queue Length 95th (ft)	58	162			#252	59	115		0			
Internal Link Dist (ft)		605			1301			489			387	
Turn Bay Length (ft)	200					200			130			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	1378	2568			1133	837	1122		1752			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.26	0.35			0.71	0.48	0.40		0.13			

Intersection Summary			
Cycle Length: 74			
Actuated Cycle Length: 56.9			
Natural Cycle: 45			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 3: I-495 NB Off Ramp/I-495 NB On Ramp & Route 140



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	108	106	359	137	104	303
Future Volume (Veh/h)	108	106	359	137	104	303
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.94	0.94	0.84	0.84
Hourly flow rate (vph)	121	119	382	146	124	361
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	1064	455			528	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1064	455			528	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	44	80			88	
cM capacity (veh/h)	217	609			1044	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	240	528	485
Volume Left	121	0	124
Volume Right	119	146	0
cSH	319	1700	1044
Volume to Capacity	0.75	0.31	0.12
Queue Length 95th (ft)	144	0	10
Control Delay (s)	43.7	0.0	3.3
Lane LOS	E		A
Approach Delay (s)	43.7	0.0	3.3
Approach LOS	E		

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	395	72	76	313	2	61	97	73	3	129	301
Future Volume (vph)	264	395	72	76	313	2	61	97	73	3	129	301
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.977				0.850		0.957				0.850
Flt Protected	0.950			0.950				0.987			0.999	
Satd. Flow (prot)	1703	3233	0	1770	1949	1830	0	1807	0	0	1880	1636
Flt Permitted	0.615			0.615				0.987			0.999	
Satd. Flow (perm)	1102	3233	0	1146	1949	1830	0	1807	0	0	1880	1636
Satd. Flow (RTOR)		12				101		12				350
Peak Hour Factor	0.90	0.90	0.90	0.77	0.77	0.77	0.70	0.70	0.70	0.86	0.86	0.86
Heavy Vehicles (%)	6%	5%	8%	2%	4%	0%	7%	6%	5%	0%	1%	2%
Adj. Flow (vph)	293	439	80	99	406	3	87	139	104	3	150	350
Shared Lane Traffic (%)												
Lane Group Flow (vph)	293	519	0	99	406	3	0	330	0	0	153	350
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases	2			6		6						
Detector Phase	5	2		1	6	6	3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	10.0	10.0		10.0	10.0	
Total Split (s)	21.0	47.0		41.0	67.0	67.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.0%	29.0%		25.3%	41.4%	41.4%	15.4%	15.4%		15.4%	15.4%	
Maximum Green (s)	15.0	41.0		35.0	61.0	61.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.0			5.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	22.1	22.1		27.5	27.5	27.5		20.7			14.3	35.3
Actuated g/C Ratio	0.21	0.21		0.26	0.26	0.26		0.20			0.14	0.34
v/c Ratio	0.91	0.75		0.23	0.79	0.01		0.89			0.60	0.45
Control Delay	72.4	46.1		34.1	48.6	0.0		68.6			55.6	4.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	72.4	46.1		34.1	48.6	0.0		68.6			55.6	4.5
LOS	E	D		C	D	A		E			E	A
Approach Delay		55.6			45.5			68.6			20.0	
Approach LOS		E			D			E			C	
Queue Length 50th (ft)	174	156		48	234	0		193			89	0
Queue Length 95th (ft)	#453	298		100	375	0		#398			205	46
Internal Link Dist (ft)		1991			447			2470			1228	
Turn Bay Length (ft)	330			115		40						115

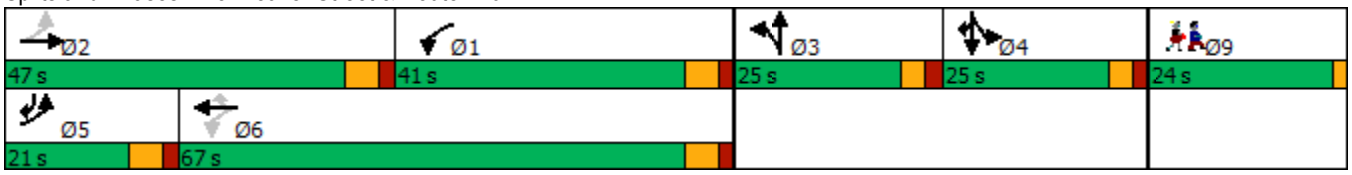
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	323	1324		688	1181	1149		369			373	781
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.91	0.39		0.14	0.34	0.00		0.89			0.41	0.45

Intersection Summary	
Cycle Length: 162	
Actuated Cycle Length: 104.3	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 46.9	Intersection LOS: D
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

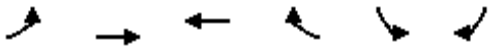
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Beaver Street & Route 140



Lane Group	Ø9
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

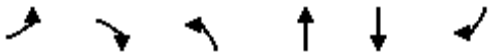


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	338	698	241	117	43	67	
Future Volume (vph)	338	698	241	117	43	67	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.956			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1728	1766	1749	0	1694	1473	
Flt Permitted	0.375				0.950		
Satd. Flow (perm)	682	1766	1749	0	1694	1473	
Satd. Flow (RTOR)			31			68	
Peak Hour Factor	0.86	0.86	0.89	0.89	0.98	0.98	
Heavy Vehicles (%)	1%	4%	7%	8%	3%	6%	
Adj. Flow (vph)	393	812	271	131	44	68	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	393	812	402	0	44	68	
Turn Type	pm+pt	NA	NA		Prot	pt+ov	
Protected Phases	7	4	8		6	6 7	9
Permitted Phases	4						
Detector Phase	7	4	8		6	6 7	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0		1.0
Minimum Split (s)	9.5	10.0	11.5		11.0		20.0
Total Split (s)	11.0	52.0	41.0		21.0		20.0
Total Split (%)	11.8%	55.9%	44.1%		22.6%		22%
Maximum Green (s)	8.0	47.0	36.0		15.0		18.0
Yellow Time (s)	3.0	3.5	3.5		3.0		2.0
All-Red Time (s)	0.0	1.5	1.5		3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	3.0	5.0	5.0		6.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0
Recall Mode	None	Min	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	33.0	30.9	19.5		7.2	18.6	
Actuated g/C Ratio	0.67	0.62	0.39		0.15	0.38	
v/c Ratio	0.62	0.74	0.57		0.18	0.11	
Control Delay	8.3	11.1	13.5		23.6	5.2	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	8.3	11.1	13.5		23.6	5.2	
LOS	A	B	B		C	A	
Approach Delay		10.2	13.5		12.4		
Approach LOS		B	B		B		
Queue Length 50th (ft)	36	127	76		11	0	
Queue Length 95th (ft)	68	228	141		41	24	
Internal Link Dist (ft)		1611	1575		7240		
Turn Bay Length (ft)	165				150		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	629	1612	1324		531	594	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.62	0.50	0.30		0.08	0.11	

Intersection Summary			
Cycle Length: 93			
Actuated Cycle Length: 49.5			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 55.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Washington Street & Grove Street

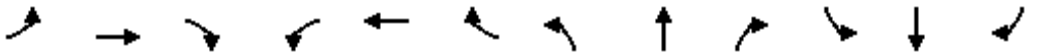


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	90	13	4	406	384	27
Future Volume (Veh/h)	90	13	4	406	384	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.92	0.92	0.94	0.85	0.85
Hourly flow rate (vph)	96	14	4	432	452	32
Pedestrians						
Lane 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	908	468	484			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	908	468	484			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	98	100			
cM capacity (veh/h)	307	599	1089			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	110	436	484
Volume Left	96	4	0
Volume Right	14	0	32
cSH	327	1089	1700
Volume to Capacity	0.34	0.00	0.28
Queue Length 95th (ft)	36	0	0
Control Delay (s)	21.5	0.1	0.0
Lane LOS	C	A	
Approach Delay (s)	21.5	0.1	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

2030 Build Weekday Evening Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	932	102	377	797	392	82	46	376	323	78	19
Future Volume (vph)	14	932	102	377	797	392	82	46	376	323	78	19
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.969		0.950		
Satd. Flow (prot)	1805	3462	0	3204	3231	1546	0	1807	1620	1728	1818	1777
Flt Permitted	0.291			0.097				0.752		0.472		
Satd. Flow (perm)	553	3462	0	327	3231	1546	0	1402	1620	858	1818	1777
Satd. Flow (RTOR)		16				413			78			78
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.91	0.91	0.91	0.86	0.86	0.86
Heavy Vehicles (%)	0%	3%	0%	2%	8%	1%	3%	0%	3%	1%	1%	0%
Adj. Flow (vph)	16	1059	116	397	839	413	90	51	413	376	91	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1175	0	397	839	413	0	141	413	376	91	22
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	5	2		1	6			8	1	7	4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	1	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.0	10.5		9.0	10.5	10.5	11.0	11.0	9.0	9.0	11.0	11.0
Total Split (s)	10.0	42.5		10.0	42.5	42.5	19.0	19.0	10.0	19.0	38.0	38.0
Total Split (%)	11.0%	47.0%		11.0%	47.0%	47.0%	21.0%	21.0%	11.0%	21.0%	42.0%	42.0%
Maximum Green (s)	6.0	37.0		6.0	37.0	37.0	13.0	13.0	6.0	15.0	32.0	32.0
Yellow Time (s)	4.0	4.5		4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0		0.0	1.0	1.0	2.0	2.0	0.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.5		4.0	5.5	5.5		6.0	4.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	Min		None	Min	Min	None	None	None	None	None	None
Act Effct Green (s)	41.3	34.0		44.8	42.1	42.1		11.8	23.9	32.9	30.9	30.9
Actuated g/C Ratio	0.48	0.39		0.52	0.49	0.49		0.14	0.28	0.38	0.36	0.36
v/c Ratio	0.05	0.86		1.08	0.53	0.43		0.74	0.82	0.79	0.14	0.03
Control Delay	10.3	31.2		88.4	17.7	3.2		60.6	39.4	36.2	20.5	0.1
Queue Delay	0.0	0.0		0.0	1.3	0.5		0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	31.2		88.4	18.9	3.7		60.6	39.4	36.2	20.5	0.1
LOS	B	C		F	B	A		E	D	D	C	A
Approach Delay		31.0			31.9			44.8			31.6	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	4	304		~83	155	0		78	182	169	35	0
Queue Length 95th (ft)	13	377		#186	261	55		#165	#339	#268	65	0
Internal Link Dist (ft)		637			292			3128			651	
Turn Bay Length (ft)	125			225		185			150	120		40
Base Capacity (vph)	352	1497		369	1582	968		211	503	478	675	709
Starvation Cap Reductn	0	0		0	496	219		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0

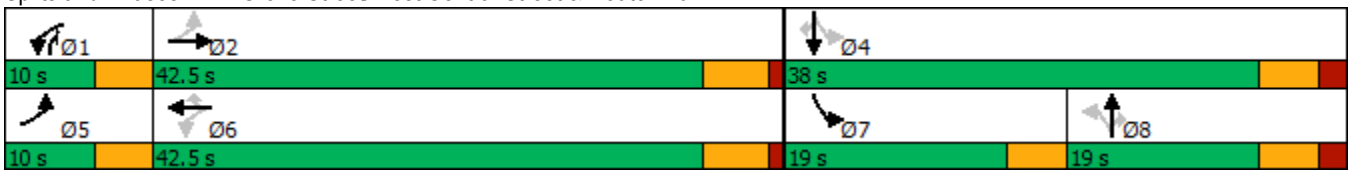
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.78		1.08	0.77	0.55		0.67	0.82	0.79	0.13	0.03

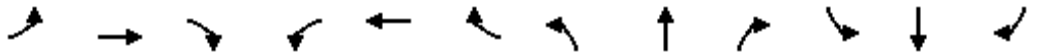
Intersection Summary	
Cycle Length: 90.5	
Actuated Cycle Length: 86.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Grove Street/West Central Street & Route 140





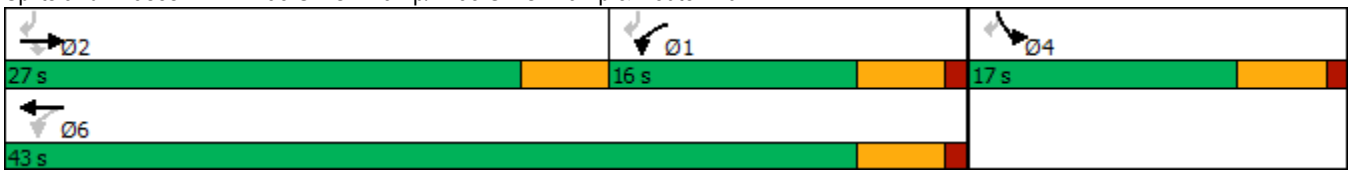
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1043	588	259	1028	0	0	0	0	469	0	538
Future Volume (vph)	0	1043	588	259	1028	0	0	0	0	469	0	538
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1794	3433	3505	0	0	0	0	3433	0	1695
Flt Permitted				0.148						0.950		
Satd. Flow (perm)	0	3539	1794	535	3505	0	0	0	0	3433	0	1695
Satd. Flow (RTOR)			661									
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.25	0.25	0.25	0.91	0.91	0.91
Heavy Vehicles (%)	0%	2%	2%	2%	3%	0%	0%	0%	0%	2%	0%	8%
Adj. Flow (vph)	0	1172	661	285	1130	0	0	0	0	515	0	591
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1172	661	285	1130	0	0	0	0	515	0	591
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								2 1 4
Detector Phase		2	2	1	6					4		2 1 4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		
Minimum Split (s)		9.0	9.0	10.0	16.0					10.0		
Total Split (s)		27.0	27.0	16.0	43.0					17.0		
Total Split (%)		45.0%	45.0%	26.7%	71.7%					28.3%		
Maximum Green (s)		23.0	23.0	11.0	38.0					12.0		
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0		
All-Red Time (s)		0.0	0.0	1.0	1.0					1.0		
Lost Time Adjust (s)		0.0	0.0	0.0	0.0					0.0		
Total Lost Time (s)		4.0	4.0	5.0	5.0					5.0		
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		
Recall Mode		Min	Min	None	Min					Min		
Walk Time (s)					5.0							
Flash Dont Walk (s)					6.0							
Pedestrian Calls (#/hr)					2							
Act Effct Green (s)		23.0	23.0	35.7	35.7					11.6		57.3
Actuated g/C Ratio		0.40	0.40	0.62	0.62					0.20		1.00
v/c Ratio		0.82	0.59	0.37	0.52					0.74		0.35
Control Delay		22.5	3.8	11.6	7.1					29.7		0.6
Queue Delay		0.2	0.0	0.0	0.0					0.0		0.0
Total Delay		22.7	3.9	11.6	7.1					29.7		0.6
LOS		C	A	B	A					C		A
Approach Delay		15.9			8.0						14.1	
Approach LOS		B			A						B	
Queue Length 50th (ft)		183	0	18	97					86		0
Queue Length 95th (ft)		#308	54	29	137					#152		0
Internal Link Dist (ft)		292			605			394			402	
Turn Bay Length (ft)				130								140

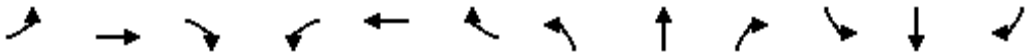
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1423	1116	912	2329					720		1653
Starvation Cap Reductn		22	16	0	0					0		0
Spillback Cap Reductn		0	0	0	0					0		0
Storage Cap Reductn		0	0	0	0					0		0
Reduced v/c Ratio		0.84	0.60	0.31	0.49					0.72		0.36

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: I-495 SB On Ramp/I-495 SB Of Ramp & Route 140





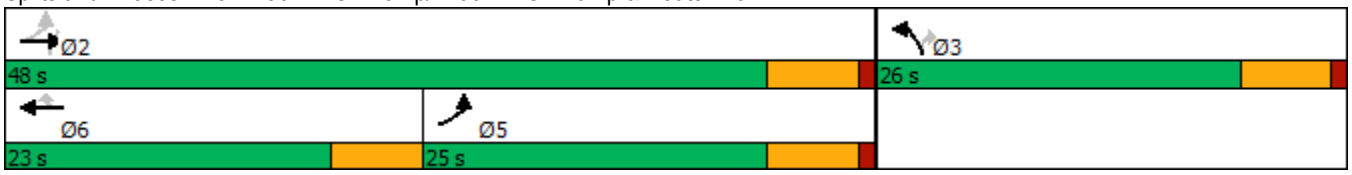
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	1117	0	0	924	439	363	0	310	0	0	0
Future Volume (vph)	395	1117	0	0	924	439	363	0	310	0	0	0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	3367	3574	0	0	3539	1794	3273	0	1794	0	0	0
Flt Permitted	0.171						0.950					
Satd. Flow (perm)	606	3574	0	0	3539	1794	3273	0	1794	0	0	0
Satd. Flow (RTOR)						467						
Peak Hour Factor	0.96	0.96	0.96	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Heavy Vehicles (%)	4%	1%	0%	0%	2%	2%	7%	0%	2%	0%	0%	0%
Adj. Flow (vph)	411	1164	0	0	983	467	432	0	369	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	411	1164	0	0	983	467	432	0	369	0	0	0
Turn Type	pm+pt	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		3					
Permitted Phases	2					6			2 3			
Detector Phase	5	2			6	6	3		2 3			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0	5.0	5.0					
Minimum Split (s)	11.0	11.0			23.0	23.0	11.0					
Total Split (s)	25.0	48.0			23.0	23.0	26.0					
Total Split (%)	33.8%	64.9%			31.1%	31.1%	35.1%					
Maximum Green (s)	19.0	42.0			18.0	18.0	20.0					
Yellow Time (s)	5.0	5.0			5.0	5.0	5.0					
All-Red Time (s)	1.0	1.0			0.0	0.0	1.0					
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0					
Total Lost Time (s)	6.0	6.0			5.0	5.0	6.0					
Lead/Lag	Lag				Lead	Lead						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0					
Recall Mode	None	Min			Min	Min	None					
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					7.0	7.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	33.3	33.3			18.4	18.4	13.6		59.1			
Actuated g/C Ratio	0.56	0.56			0.31	0.31	0.23		1.00			
v/c Ratio	0.52	0.58			0.89	0.53	0.58		0.21			
Control Delay	16.9	10.2			34.9	5.0	23.9		0.3			
Queue Delay	0.0	0.0			0.0	0.0	0.0		0.0			
Total Delay	16.9	10.2			34.9	5.0	23.9		0.3			
LOS	B	B			C	A	C		A			
Approach Delay		11.9			25.3			13.0				
Approach LOS		B			C			B				
Queue Length 50th (ft)	32	122			161	0	65		0			
Queue Length 95th (ft)	65	219			#398	68	117		0			
Internal Link Dist (ft)		605			1354			489			387	
Turn Bay Length (ft)	200					200			130			

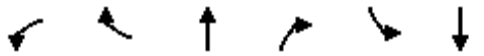
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	1345	2593			1100	879	1131		1783			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	0.31	0.45			0.89	0.53	0.38		0.21			

Intersection Summary	
Cycle Length: 74	
Actuated Cycle Length: 59.1	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 17.2	Intersection LOS: B
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: I-495 NB Off Ramp/I-495 NB On Ramp & Route 140

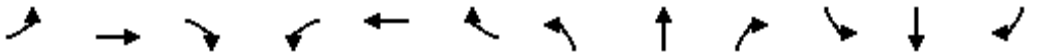




Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	148	90	343	139	107	399
Future Volume (Veh/h)	148	90	343	139	107	399
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.87	0.87	0.88	0.88
Hourly flow rate (vph)	190	115	394	160	122	453
Pedestrians						
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	1171	474			554	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1171	474			554	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	81			88	
cM capacity (veh/h)	188	595			1026	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	305	554	575
Volume Left	190	0	122
Volume Right	115	160	0
cSH	253	1700	1026
Volume to Capacity	1.21	0.33	0.12
Queue Length 95th (ft)	361	0	10
Control Delay (s)	165.1	0.0	3.1
Lane LOS	F		A
Approach Delay (s)	165.1	0.0	3.1
Approach LOS	F		

Intersection Summary			
Average Delay	36.3		
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	509	70	79	491	12	80	103	87	5	91	321
Future Volume (vph)	283	509	70	79	491	12	80	103	87	5	91	321
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982				0.850		0.957				0.850
Flt Protected	0.950			0.950				0.985			0.997	
Satd. Flow (prot)	1770	3368	0	1805	1968	1830	0	1898	0	0	1877	1652
Flt Permitted	0.323			0.413				0.985			0.997	
Satd. Flow (perm)	602	3368	0	785	1968	1830	0	1898	0	0	1877	1652
Satd. Flow (RTOR)		9				101		12				382
Peak Hour Factor	0.92	0.92	0.92	0.83	0.83	0.83	0.85	0.85	0.85	0.84	0.84	0.84
Heavy Vehicles (%)	2%	2%	0%	0%	3%	0%	1%	1%	0%	0%	1%	1%
Adj. Flow (vph)	308	553	76	95	592	14	94	121	102	6	108	382
Shared Lane Traffic (%)												
Lane Group Flow (vph)	308	629	0	95	592	14	0	317	0	0	114	382
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	5	2		1	6		3	3		4	4	4 5
Permitted Phases	2			6		6						
Detector Phase	5	2		1	6	6	3	3		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0		11.0	11.0	11.0	10.5	10.5		10.0	10.0	
Total Split (s)	21.0	47.0		41.0	67.0	67.0	25.0	25.0		25.0	25.0	
Total Split (%)	13.0%	29.0%		25.3%	41.4%	41.4%	15.4%	15.4%		15.4%	15.4%	
Maximum Green (s)	15.0	41.0		35.0	61.0	61.0	20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		5.0			5.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min	Min	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	28.0	28.0		40.2	40.2	40.2		20.8			13.4	34.5
Actuated g/C Ratio	0.24	0.24		0.35	0.35	0.35		0.18			0.12	0.30
v/c Ratio	1.02	0.77		0.18	0.87	0.02		0.91			0.53	0.50
Control Delay	100.2	48.9		31.1	50.9	0.1		77.0			61.8	5.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Delay	100.2	48.9		31.1	50.9	0.1		77.0			61.8	5.5
LOS	F	D		C	D	A		E			E	A
Approach Delay		65.7			47.2			77.0			18.4	
Approach LOS		E			D			E			B	
Queue Length 50th (ft)	197	211		45	380	0		212			76	0
Queue Length 95th (ft)	#484	394		102	637	0		#573			171	44
Internal Link Dist (ft)		1904			667			2500			727	
Turn Bay Length (ft)	330			115		40						115

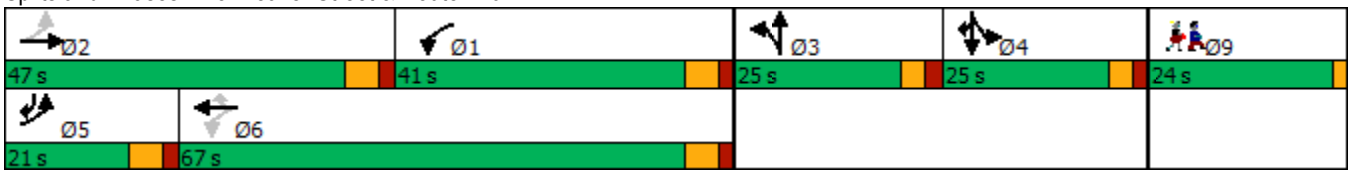
Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Satd. Flow (RTOR)	
Peak Hour Factor	
Heavy Vehicles (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	24.0
Total Split (s)	24.0
Total Split (%)	15%
Maximum Green (s)	22.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	15.0
Pedestrian Calls (#/hr)	2
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)	301	1239		647	1072	1043		349			335	756
Starvation Cap Reductn	0	0		0	0	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	1.02	0.51		0.15	0.55	0.01		0.91			0.34	0.51

Intersection Summary	
Cycle Length: 162	
Actuated Cycle Length: 116.3	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 52.3	Intersection LOS: D
Intersection Capacity Utilization 77.5%	ICU Level of Service D
Analysis Period (min) 15	

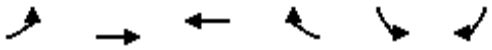
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Beaver Street & Route 140

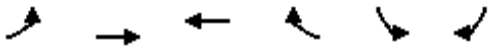


Lane Group	Ø9
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary



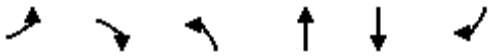
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Lane Configurations							
Traffic Volume (vph)	139	397	716	77	106	385	
Future Volume (vph)	139	397	716	77	106	385	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.987			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1728	1801	1900	0	1678	1546	
Flt Permitted	0.102				0.950		
Satd. Flow (perm)	185	1801	1900	0	1678	1546	
Satd. Flow (RTOR)			7			412	
Peak Hour Factor	0.94	0.94	0.91	0.91	0.81	0.81	
Heavy Vehicles (%)	1%	2%	2%	2%	4%	1%	
Adj. Flow (vph)	148	422	787	85	131	475	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	148	422	872	0	131	475	
Turn Type	pm+pt	NA	NA		Prot	pt+ov	
Protected Phases	7	4	8		6	6 7	9
Permitted Phases	4						
Detector Phase	7	4	8		6	6 7	
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0		5.0		1.0
Minimum Split (s)	9.5	10.0	11.5		11.0		20.0
Total Split (s)	11.0	52.0	41.0		21.0		20.0
Total Split (%)	11.8%	55.9%	44.1%		22.6%		22%
Maximum Green (s)	8.0	47.0	36.0		15.0		18.0
Yellow Time (s)	3.0	3.5	3.5		3.0		2.0
All-Red Time (s)	0.0	1.5	1.5		3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0		
Total Lost Time (s)	3.0	5.0	5.0		6.0		
Lead/Lag	Lead		Lag				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0
Recall Mode	None	Min	None		Min		None
Walk Time (s)							7.0
Flash Dont Walk (s)							11.0
Pedestrian Calls (#/hr)							0
Act Effct Green (s)	48.9	46.9	36.1		10.6	21.5	
Actuated g/C Ratio	0.71	0.68	0.53		0.15	0.31	
v/c Ratio	0.48	0.34	0.87		0.50	0.62	
Control Delay	12.0	5.8	27.0		33.5	7.4	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	12.0	5.8	27.0		33.5	7.4	
LOS	B	A	C		C	A	
Approach Delay		7.4	27.0		13.1		
Approach LOS		A	C		B		
Queue Length 50th (ft)	15	60	295		51	19	
Queue Length 95th (ft)	64	123	#599		88	57	
Internal Link Dist (ft)		1611	1575		7210		
Turn Bay Length (ft)	165				150		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø9
Base Capacity (vph)	312	1236	1002		367	754	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.47	0.34	0.87		0.36	0.63	

Intersection Summary			
Cycle Length: 93			
Actuated Cycle Length: 68.6			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 6: Washington Street & Grove Street



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	44	6	10	438	478	69
Future Volume (Veh/h)	44	6	10	438	478	69
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.92	0.92	0.87	0.85	0.85
Hourly flow rate (vph)	51	7	11	503	562	81
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	1128	602	643			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1128	602	643			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	77	99	99			
cM capacity (veh/h)	226	503	951			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	58	514	643
Volume Left	51	11	0
Volume Right	7	0	81
cSH	242	951	1700
Volume to Capacity	0.24	0.01	0.38
Queue Length 95th (ft)	23	1	0
Control Delay (s)	24.5	0.3	0.0
Lane LOS	C	A	
Approach Delay (s)	24.5	0.3	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		