PIN 8761.83
Manville Road Corridor Improvement Project
Traffic Study
FINAL REPORT

Prepared by: HVEA Engineers
560 Route 52
Suite 201
Beacon NY 12538

Prepared for: Village of Pleasantville
And
New York State Department of Transportation

December 2018

LOCATION MAP

EXECUTIVE SUMMARY

The Village of Pleasantville is developing a Federal Aid Local Project, **PIN 8761.83 Manville Road Corridor Improvement Project**, that proposes to make several changes to the traffic movements near the Memorial Plaza and the Manville Road/Grant St/ Memorial Plaza intersection. The most notable of the improvements is the Memorial Plaza slip ramp to Manville Road being eliminated and replaced by an exclusive right turn lane from Memorial Plaza to Manville Road. In addition, there are several parking spaces being eliminated from the Memorial Plaza lot and a minor change to traffic routing through the lot.

Traffic counts were taken at several intersections in the immediate vicinity of Memorial Plaza:

- Bedford Road at Memorial Plaza
- Manville Road at Memorial Plaza/Grant Street
- Manville Road at Wheeler Avenue
- Manville Road at Washington Avenue
- Manville Road at Tompkins Avenue.

The Level of Service (LOS) analysis for these intersections shows all operating at an overall LOS C or better in both the AM and PM peak hours. The analysis for the “slip ramp” removal and replacement with an exclusive right turn lane at the Memorial Plaza/Grant St/Manville Road intersection shows both the AM and PM peak hours LOS and delays almost identical to the current “slip ramp” condition. The LOS for the future 10-year condition is also acceptable.

When evening trains arrive, and commuter vehicles depart there are brief periods of temporary queueing along Grant Street through the Memorial Plaza intersection that limit traffic movement. Coordination with NYSDOT to review the existing Grant street signal timing and queue lengths, as well as the Manville Road traffic signal coordination, may result in a more equitable timing/phasing scheme, reduced queuing along Manville Road.

It was noted that the Wheeler Ave and Washington Ave traffic signals on Manville Road both have exclusive pedestrian phase operation, which have been accounted for in the analysis. Retention of the Wheeler Avenue traffic signal, as is, should be discussed further with NYSDOT.

The Memorial Plaza changes will remove several parking spaces from the Memorial Plaza parking lot; however, there are underutilized parking spaces available in nearby Village parking lots.

The conclusion of the study is that there should be no additional delays occurring from the elimination of the Memorial Plaza “slip ramp”, and replacement with an exclusive right turn lane to Manville Road.

BACKGROUND

The Village of Pleasantville has a project, PIN 8761.83 Manville Road Corridor Improvement Plan that proposes to make several changes to the traffic movements near the Memorial Plaza and the Manville Road/Grant St/ Memorial Plaza intersection.

The proposed traffic changes are:

- eliminate the "slip ramp" used by the Memorial Plaza parking lot traffic and used by WB Memorial Plaza traffic turning right to go NB on Manville Road,
- add a right turn lane for WB Memorial Plaza and parking lot traffic to replace the eliminated "slip ramp,
- modify the location for egress to the Memorial Plaza lot,
- add a right turn lane from SB Manville Road to WB Grant Street, and
- eliminate excess roadway width on Manville Road west of Wheeler Avenue.

For this report HVEA has counted the existing AM and PM peak hours traffic movements at selected intersections in the immediate vicinity of Memorial Plaza, surveyed the existing parking lots near Memorial Plaza to determine utilization, run Highway Capacity Software analysis of the existing Memorial Plaza/Manville Road traffic movements and those same traffic movements with the proposed Improvements. Signal timing used in the software analysis were field verified.

HVEA was made aware of a proposed development at 70 Memorial Plaza that is seeking approval from the village. The development proposes all vehicle access from Cooley Street and anticipates generating 22 vehicle trips in the AM peak hour and 18 vehicle trips in the PM peak hour. To account for this activity vehicle trips as distributed in the AKRF Parking & Traffic Study dated September 26, 2018[1] were added to our traffic counts and LOS analysis.

In July 2007 the RBA Group of NY performed a traffic analysis in the "***Memorial Plaza Intermodal Conceptual Planning Study".*** One of the study's recommendations was the removal of the Memorial Plaza "slip ramp" to improve overall traffic flow there. It should also be noted that since the 2007 study, traffic peak hour volumes have **decreased** an average of 17.6% in the AM peak hour and 9.1% in the PM peak hour for four of the intersections studied here and in the RBA report. This equates to an approximate 1.7% per year decrease in AM peak hour traffic, and 0.9% per year decrease in PM peak hour traffic.

[1] AKRF, Inc. 70 Manville Road Traffic/Parking Study – September 26, 2018

CRITICAL INTERSECTIONS

It was determined, in consultation with Village Officials, that the intersections most affected from the proposed project improvements would be:

- Bedford Road at Memorial Plaza
- Manville Road at Memorial Plaza/Grant Street
- Manville Road at Wheeler Avenue
- Manville Road at Washington Avenue
- Manville Road at Tompkins Avenue

Manual traffic counts were taken on November 2nd, 2017. The time periods selected for observation were 6:00 to 8:00 AM and 3:00 to 6:00 PM. These times were selected based upon the latest available NYSDOT 24hr automatic machine counts for Manville Road and Bedford Road. In addition, HVEA undertook an hourly assessment of "Permit Only" parking usage at Memorial Plaza and Cooley Street and the metered parking lot on Manville Road opposite Wheeler Avenue.

The counts at Manville Road/ Memorial Plaza/Grant Street were subsequently taken again on November 7th, 2018 and extended to 9 AM in the morning and 7 PM in the evening to confirm the peak hour period. This resulted in a revised AM peak hour period of 7 AM to 9 AM while the PM peak hour period remains unchanged at 4 PM to 6 PM. Traffic flows upstream and downstream were adjusted to balance with the revised traffic counts, where appropriate.

Due to the Grant Street PM queuing that coincided with evening train arrivals, PM turning movement counts were taken at the Grant Street/Sawmill River Parkway intersection in April 2018 and a capacity analysis performed including an assessment of queues on Grant Street.

Appendix A contains the summary of the turning movement counts for the AM and PM peak hour periods at each of the critical intersections, and traffic volume inputs used throughout the analysis process.

TRAFFIC ANALYSIS

Methodology

Intersection traffic flow conditions are categorized in terms of "Levels-of-Service" (LOS) measurements based upon vehicle delay generally designated LOS A thru LOS F. LOS C is generally used as a design standard while an intersection LOS D is ideally acceptable during peak periods given that all approaches have LOS D or better. LOS E represents an operation at or near capacity, which often represents peak hour activity particularly on state highways. LOS E and even LOS F are not unusual during peak hours and are acceptable for relatively short time periods or at intersections of heavily traveled state highways.

To identify a signalized intersection's level-of-service, the average amount of vehicle delay is computed for each approach to the intersection as well as for the over-all intersection. For un-signalized intersections, the average vehicle delay is computed for each critical movement to the intersection, which are normally the stop or yield controlled approaches along with the left-turns from the main roadways. It should also be noted that the SYNCHRO/HCS results provided are a static evaluation of each intersection.

Tables 1 and 2 below summarize the level-of-service criteria for the signalized and un-signalized intersections

Table 1: Signalized Level-of-Service

LOS	Control Delay Per Vehicle (seconds)
A	Less than or equal to **10**
B	Greater than **10** and less than or equal to **20**
C	Greater than **20** and less than or equal to **35**
D	Greater than **35** and less than or equal to **55**
E	Greater than **55** and less than or equal to **80**
F	Greater than **80**

Table 2: Un-signalized Level-of-Service

LOS	Control Delay Per Vehicle (seconds)
A	Less than or equal to **10**
B	Greater than **10** and less than or equal to **15**
C	Greater than **15** and less than or equal to **25**
D	Greater than **25** and less than or equal to **35**
E	Greater than **35** and less than or equal to **50**
F	Greater than **50**

The project proposes to eliminate the existing right turn "slip-ramp" at the Manville Road/Memorial Plaza/Grant Street intersection, and to add a right turn lane at the intersection to accommodate that move; as well as add a Right Turn storage lane from westbound Manville Road to Grant Street. This will result in "slip ramp" right turns being made at the signalized intersection. For the purposes of this evaluation it is assumed there will be no redistribution of traffic resulting from this action, i.e. the "slip-ramp" volume shall remain unchanged even where alternative routing is available. This represents the "worst-case" scenario and HVEA has analyzed the intersection with "free" right turns for the Existing Condition and signalized right turns for the Proposed Condition.

Findings

The intersection traffic data was analyzed using SYNCHRO Traffic Analysis Software by Trafficware which is based upon the nationally recognized 2000 and 2010 Highway Capacity Manual. The SYNCHRO worksheets are included in Appendix B of this report.

In addition, after consultation with the NYSDOT Region 8 Office, future traffic counts were projected 10 years from the Estimated Time of Completion (ETC) in 2020 via a 0.5% per annum growth rate. The analysis results are summarized on the following pages for Existing (2018), Proposed (2020), and Projected (2030) conditions for each of the critical intersections analyzed.

1. Bedford Road at Memorial Plaza

Capacity Analysis [LOS/Average Delay in Seconds]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Bedford Road at Memorial Plaza Signalized	AM	**OVERALL** EB WB NB SB	**A/9.9** A/7.6 A/7.7 B/15.3 B/14.5	**B/10.7** A/8.7 A/8.3 B/16.1 B/14.8	**B/11.2** A/9.0 A/8.6 B/17.1 B/15.5
	PM	**OVERALL** EB WB NB SB	**B/15.4** B/13.6 B/14.0 B/19.7 B/12.3	**B/15.9** B/14.1 B/14.2 C/20.4 B/12.6	**B/17.6** B/16.6 B/14.9 C/22.9 B/13.4

The analysis indicates acceptable LOS under Existing (2018), Proposed (2020), and Projected (2030) conditions and minimal to minor delay increase resulting from the elimination of the "slip ramp" at the Manville Road/Memorial Plaza/Grant Street intersection.

2. Manville Road at Memorial Plaza/Grant Street

Capacity Analysis [LOS/Average Delay in Seconds]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Manville Road at Memorial Plaza/Grant Street Signalized	AM	**OVERALL**	**B/14.4**	**B/14.0**	**B/14.9**
		EB	B/12.6	B/13.1	B/14.8
		WB	B/10.8	A/8.8	A/9.4
		WBTL	n.a.	B/10.5	B/11.3
		WBR	n.a.	A/2.7	A/2.7
		NB	B/18.9	B/13.6	B/13.6
		NBTL	n.a.	B/18.7	B/18.7
		NBR	n.a.	A/5.4	A/5.2
		SB	C/25.6	C/27.1	C/27.3
	PM	**OVERALL**	**B/15.6**	**B/12.5**	**B/13.4**
		EB	B/14.5	B/14.6	B/16.7
		WB	B/13.2	A/8.4	A/9.1
		WBTL	n.a.	B/10.9	B/11.8
		WBR	n.a.	A/2.3	A/2.3
		NB	C/23.7	B/14.2	B/14.1
		NBTL	n.a.	C/22.7	C/22.7
		NBR	n.a.	A/5.5	A/5.4
		SB	B/18.3	B/18.1	B/18.1

The analysis shows acceptable LOS under Existing (2018), Proposed (2020), and Projected (2030) conditions with an overall LOS B maintained throughout. The addition of the Right Turn storage lanes on the westbound (Manville Road) and northbound (Memorial Plaza) approaches results in improved LOS for those approaches and hence an overall improvement in average vehicle delay for the intersection. An assessment of estimated queue lengths versus proposed storage capacity is provided as follows:

Estimated 95th Percentile Queue Lengths [feet]

Intersection	Peak Hour	Movement	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Manville Road at Memorial Plaza/Grant Street Signalized	AM	WBR NBR	n.a. n.a.	18 23	19 23
	PM	WBR NBR	n.a. n.a.	25 36	25 37

It is evident from the above that the 100 foot storage capacity for each of the proposed storage lanes is sufficient to accommodate the estimated queues.

Under existing conditions "slip ramp" traffic has a YIELD controlled move to Manville Road. Some "slip ramp" traffic was observed turning left across Manville Road (a prohibited move) to access Depew Avenue via Vanderbilt Avenue to "beat" the traffic proceeding to Grant Street and the Saw Mill River Parkway via the signalized intersection. This "slip ramp" left turn move is curtailed under the proposed action.

Intermittent queueing of northbound traffic from Manville Road onto Grant Street was observed which temporarily impacted traffic at the intersection, specifically during the PM peak period. The queueing was intermittent and restricted the traffic entering Grant Street from Manville Road (left and right turns) and Memorial Plaza (straight) from not being able to do so. This situation was particularly pronounced upon arrival of a train and associated vehicles from the Memorial Plaza and other Village parking lots. It was not apparent whether the queueing on Grant Street resulted solely from the signalized intersection of Grant Street at Sawmill River Parkway, or from the influx of vehicles from access points along Grant Street. While we do not see foresee the intermittent queueing on Grant Street to be a significant deterrent to the proposed action, we do acknowledge the potential for temporary increased delays. As such, PM turning movement counts were taken at the Grant Street/Sawmill River Parkway intersection in April 2018 and a subsequent capacity analysis performed including an assessment of queues on Grant Street.

The results are summarized as follows:

Capacity Analysis [LOS/Average Delay in Seconds]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Grant Street at Saw Mill River Parkway Signalized	AM	n.a.	n.a.	n.a.	n.a.
	PM	**<u>OVERALL</u>** NEB(SMRP) SWB(SMRP) NB(Grant) SB	**C/27.6** C/22.7 C/20.7 E/55.9 C/22.1	**C/28.9** C/29.4 C/21.4 E/57.2 C/22.2	**D/37.4** D/42.3 C/25.9 E/63.7 C/22.9

Estimated 95th Percentile Queue Lengths [feet]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Grant Street at Saw Mill River Parkway Signalized	AM	n.a.	n.a.	n.a.	n.a.
	PM	Grant Street	382	389	418

The Grant Street (NB) approach is currently operating at LOS E or near capacity as evidenced by the volume to capacity ratio (v/c) of 0.93. This condition is expected to continue though the Proposed (2020) action and to 2030 under current growth projections. The associated queue length of 382 is significant since vehicle storage length on Grant Street from the Saw Mill River Parkway to Manville Road is approximately 450 feet. The peak hour traffic conditions on Grant Street will continue to impact the Manville Road/Memorial Plaza/Grant Street intersection. As such, it is suggested that the Village discuss with the NYSDOT the need for a comprehensive review of the signal operation to arrive at a more equitable timing/phasing scheme.

3. **Manville Road at Wheeler Avenue and**
4. **Manville Road at Washington Avenue**

These intersections are under signalized traffic control from one controller located at Washington Avenue. The Wheeler Avenue intersection consists of Manville Road (east/west), ingress/egress to a 3- Hour metered parking lot to the north, and Wheeler Avenue to the south (designated "One Way" southbound). The parking lot exit is under "STOP" control (flashing RED indications) having no vehicle detection and hence having no influence on the signal operation.

The analysis results are summarized as follows:

Capacity Analysis [LOS/Average Delay in Seconds]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Manville Road at Wheeler Avenue Signalized	AM	**OVERALL** EB WB	**C/28.1** D/43.4 A/8.5	**C/30.9** D/47.8 A/9.2	**D/39.1** E/61.2 B/10.9
	PM	**OVERALL** EB WB	**B/11.2** B/17.7 A/5.3	**B/11.6** B/18.2 A/5.7	**B/12.6** B/19.0 A/6.9
Manville Road at Washington Avenue Signalized	AM	**OVERALL** EB WB SB	**B/15.8** A/4.2 D/35.4 B/11.3	**B/16.1** A/4.7 D/36.0 B/11.3	**B/16.8** A/5.1 D/38.0 B/11.3
	PM	**OVERALL** EB WB SB	**B/17.6** A/5.2 C/32.4 B/14.3	**B/17.8** A/5.2 C/32.9 B/14.3	**B/18.7** A/6.0 C/34.3 B/14.3

The LOS analysis at Manville/Wheeler resulted in acceptable values under current conditions with minimal delay increase under the proposed action for both intersections. The projected 2030 conditions indicate LOS E in the AM on the eastbound approach to Wheeler Avenue which may be improved via adjustments to the signal timing.

The analysis at the Manville Road/Washington Avenue intersection again results in acceptable LOS under existing conditions with minimal delay increase under the proposed action.

Both intersections are subject to "Exclusive Pedestrian" calls which mandate a stop of all vehicular traffic regardless of the direction of pedestrian activity. While this represents the most "pedestrian friendly" condition there are additional delays to traffic on all approaches in direct relation to the frequency of pedestrian calls. Pedestrian activity has been accounted for by assuming approximately 50% of signal cycles in the peak hour are subject to pedestrian calls.

The observed queue lengths at the eastbound approach to Wheeler Avenue are of concern given the proximity to the Memorial/Manville/Grant intersection. The estimated queue lengths are summarized as follows:

Estimated 95th Percentile Queue Lengths [feet]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Wheeler Avenue at Manville Road Signalized	AM	EB	420	431	461
	PM	EB	351	361	386

The distance to the signalized intersection at Memorial/Manville/Grant Street is approximately 300 feet. As observed, traffic currently queues on the excess pavement width between Wheeler Avenue and the "slip ramp" with queuing also being accommodated on the slip ramp itself. Traffic operations are also impacted at the Manville/Memorial Plaza/Grant Street intersection with sporadic interruptions to eastbound traffic flow through that intersection.

5. Manville Road at Tomkins Avenue

Capacity Analysis [LOS/Average Delay in Seconds]

Intersection	Peak Hour	Approach	Existing Conditions (2018)	Proposed Conditions (2020)	Projected Conditions (2030)
Manville Road at Tomkins Avenue Un-signalized	AM	WB NB	A/8.4 C/18.9	A/8.5 C/19.6	A/8.6 C/21.3
	PM	WB NB	A/8.0 C/16.2	A/8.0 C/16.6	A/8.0 C/17.7

This un-signalized intersection exhibits acceptable LOS under existing conditions, with no noticeable change indicated under the proposed action or projected conditions in 2030.

Pedestrian Activity

Pedestrians were observed crossing the intersections during the traffic counting exercise. They are accounted for on the AM and PM peak hour traffic counts in Appendix A.

The traffic signals on Manville Road at Wheeler Avenue and Washington Avenue have an exclusive ped phase. This means when a pedestrian pushes the button to engage the pedestrian phase of the signal, there is an all red phase where no vehicular traffic moves until the phase times out. This phase is 25 total seconds at Wheeler Ave and 25 total seconds at Washington Ave. (Other signals on Manville Road have a concurrent ped phase meaning pedestrians cross in conjunction with traffic travelling in the same direction that they are.)

We have included 50% ped phase activations on all Manville Road intersections in our LOS analysis.

Parking Utilization

Summation of the parking lot utilization is below. It is evident that permit parking at the Cooley Street lot is under-utilized (maximum 65% utilization with 25 spaces empty). It is expected that spaces lost due to modifications at the Memorial Plaza Parking Lot can be accommodated at the Cooley Street lot and, spaces at the current 3-hour metered parking lot may be converted as a last resort if necessary.

	Permit Parking at Memorial Plaza:		102 spaces
	Spaces Occupied	% Utilization	Spaces Empty
11/1/2017			
8:00 AM	62	60.78%	40
9:00 AM	77	75.49%	25
10:00 AM	89	87.25%	13
11:00 AM	90	88.24%	12
12:00 PM	92	90.20%	10
1:00 PM	92	90.20%	10
2:00 PM	96	94.12%	6
3:00 PM	93	91.18%	9
04/12/18			
4:00 PM	100	98.04%	2
5:00 PM	98	96.08%	4
6:00 PM	97	95.10%	5
7:00 PM	86	84.31%	16

	Permit Parking at Cooley Street:		71 spaces
	Spaces Occupied	% Utilization	Spaces Empty
8:00 AM	30	42.25%	41
9:00 AM	36	50.70%	35
10:00 AM	43	60.56%	28
11:00 AM	44	61.97%	27
12:00 PM	44	61.97%	27
1:00 PM	47	66.20%	24
2:00 PM	46	64.79%	25
3:00 PM	43	60.56%	28

3 Hr. Metered Parking Lot: 43 spaces

Manville Road opposite Wheeler Avenue

	Spaces Occupied	% Utilization	Spaces Empty
8:00 AM	5	11.63%	38
9:00 AM	7	16.28%	36
10:00 AM	11	25.58%	32
11:00 AM	20	46.51%	23
12:00 PM	27	62.79%	16
1:00 PM	43	100.00%	0
2:00 PM	39	90.70%	4
3:00 PM	43	100.00%	0

Memorial Parking Lot Circulation

HVEA has reviewed the two concepts, currently under consideration by the Village, for the Memorial Parking Lot reconfiguration in relation to the proposed "slip ramp" removal and the Memorial/Grant/Manville Signal upgrades. Please refer to the Appendix - C, and our following comments:

- Internal traffic circulation should stay as it currently exists, one-way flow from the south to north.
- Only right turns should be allowed at the North exit. Having left turns safely navigate across two west-bound lanes is problematic and may result in additional delays to traffic entering and exiting Memorial Plaza.
- The existing mid-lot exit should be moved South, closer to the mid-way point, and widened to allow both ingress and egress. Left turns from the mid-lot exit would allow some drivers to safely proceed to Bedford Road.
- Provide a stripped "cross walk" between cars on the east side of the lot for "drop offs" near the mid-lot exit. This will allow Bedford Road bound drop offs to exit at the mid-lot exit location and turn left.

The concept of modifying the mid-lot access to allow right and left turns out and act as a new entrance point has both benefits and unknowns. The benefits are a greater degree of freedom to move both in and out of the lot. The unknowns are what, if any, detrimental conflicts may arise from the change in lot's vehicle circulation pattern.

Traffic conflicts could arise from:

- the influx of mid lot entrants with the traffic exiting there, now in both directions,
- the mid lot entrants merging/converging with the existing parking lot NB traffic flow,
- and, mid lot entrants turning right (southbound) to access nearby empty parking spaces.

If those conflicts become problematic, the access here can be easily modified.

CONCLUSION

The Manville Road Corridor Improvements, Federal Aid Project 8761.38, proposes to close the Memorial Plaza "slip ramp" to Manville Road and replace it with a dedicated right turn lane at the Memorial Plaza/Grant St/Manville Road intersection traffic signal. This is the most visible change to the area from the project. There are other minor roadway modifications including stripping, concrete medians and crosswalk curb extensions, all intended to improve pedestrian safety.

An analysis of existing traffic volumes at key intersections show they operate in the peak hours at an overall Level of Service C or better, which is acceptable for a suburban setting. The elimination of the slip ramp and addition of the exclusive right turn lane results in no discernable change to traffic delay or LOS at that location.

One situation that requires future vigilance is the temporary queueing of traffic along Grant Street from the arrival of evening trains and dispersion of vehicles from the commuter parking lots. This is an evening ritual that plays out at all train stations along the Metro North Rail Line. These periodic evening queues of departing traffic usually dissipate in 5 to 10 minutes and occur at the next train arrival. This is a temporary inconvenience. However, if rail commuter numbers start to increase, additional traffic control measures might be needed to insure the temporary queuing does not lead to an extended "grid-lock" situation.

Another consideration for Manville Road would be to discuss with NYSDOT the possibility of Route 117 traffic signal coordination through the Village as part of the project, including the future role of the traffic signal at Wheeler Avenue.

Like the rail commuter numbers, the amount of pedestrian activity in the study area may also lead to increased traffic delays in the future. If pedestrian activity at the signalized intersections markedly increases, this could also result in increased vehicle delay, especially at signals with exclusive pedestrian phases.

Lastly, traffic peak hour volumes in the study area are below the levels seen in the 2007 study of Village traffic. The 2017 traffic peak hour volumes at the four intersections also counted in 2007 are an average 17.6% below the AM peak and an average 9.1% below the PM peak of 2007.

APPENDICES

Appendix A – Intersection Turning Movement Counts

Appendix B – SYNCHRO Analysis Worksheets

Appendix C – Memorial Plaza Parking Lot Circulation

APPENDIX A

TRAFFIC COUNTS AND TRAFFIC VOLUME FIGURES

HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Bedford at Memorial Plaza
November 1, 2017
6:00 - 8:00 AM

File Name : Bedford_Memorial AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Memorial Plaza From North					Bedford Road From East					Marble Ave From South					Bedford Road From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	5	5	8	18	4	8	6	2	20	4	5	2	4	15	5	10	24	0	39	92
06:15 AM	1	5	4	2	12	5	7	7	0	19	12	9	2	4	27	7	24	33	0	64	122
06:30 AM	0	5	3	3	11	11	21	6	1	39	14	13	4	0	31	10	21	36	0	67	148
06:45 AM	1	9	7	7	24	8	21	14	0	43	14	21	17	2	54	8	29	35	1	73	194
Total	2	24	19	20	65	28	57	33	3	121	44	48	25	10	127	30	84	128	1	243	556
07:00 AM	1	14	6	1	22	11	28	16	1	56	15	13	7	3	38	14	43	41	0	98	214
07:15 AM	4	11	1	13	29	15	33	18	11	77	24	26	14	9	73	18	59	32	0	109	288
07:30 AM	8	18	9	2	37	30	41	13	3	87	32	23	12	4	71	8	82	40	0	130	325
07:45 AM	9	20	11	12	52	18	72	32	6	128	34	29	9	6	78	9	91	36	0	136	394
Total	22	63	27	28	140	74	174	79	21	348	105	91	42	22	260	49	275	149	0	473	1221
Grand Total	24	87	46	48	205	102	231	112	24	469	149	139	67	32	387	79	359	277	1	716	1777
Apprch %	11.7	42.4	22.4	23.4		21.7	49.3	23.9	5.1		38.5	35.9	17.3	8.3		11	50.1	38.7	0.1		
Total %	1.4	4.9	2.6	2.7	11.5	5.7	13	6.3	1.4	26.4	8.4	7.8	3.8	1.8	21.8	4.4	20.2	15.6	0.1	40.3	
Passenger Vehicles	23	85	43	48	199	101	212	110	24	447	136	129	65	32	362	76	344	270	1	691	1699
% Passenger Vehicles	95.8	97.7	93.5	100	97.1	99	91.8	98.2	100	95.3	91.3	92.8	97	100	93.5	96.2	95.8	97.5	100	96.5	95.6
Trucks	0	1	0	0	1	1	9	0	0	10	10	10	1	0	21	2	1	5	0	8	40
% Trucks	0	1.1	0	0	0.5	1	3.9	0	0	2.1	6.7	7.2	1.5	0	5.4	2.5	0.3	1.8	0	1.1	2.3
Buses	1	1	3	0	5	0	10	2	0	12	3	0	1	0	4	1	14	2	0	17	38
% Buses	4.2	1.1	6.5	0	2.4	0	4.3	1.8	0	2.6	2	0	1.5	0	1	1.3	3.9	0.7	0	2.4	2.1

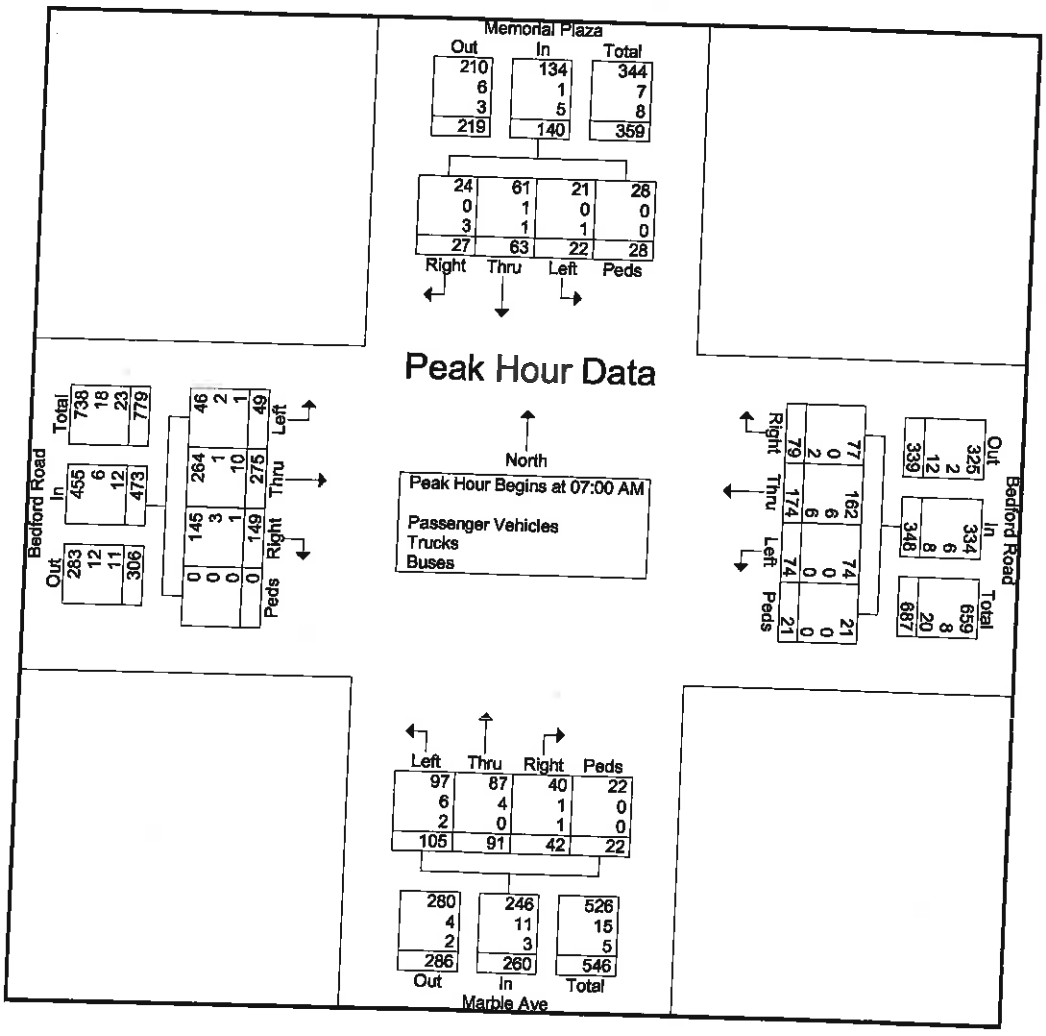
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Bedford at Memorial Plaza
November 1, 2017
6:00 - 8:00 AM

File Name : Bedford_Memorial AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Memorial Plaza From North					Bedford Road From East					Marble Ave From South					Bedford Road From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	14	6	1	22	11	28	16	1	56	15	13	7	3	38	14	43	**41**	0	98	214
07:15 AM	4	11	1	**13**	29	15	33	18	**11**	77	24	26	**14**	**9**	73	**18**	59	32	0	109	288
07:30 AM	8	18	9	2	37	**30**	41	13	3	87	32	23	12	4	71	8	82	40	0	130	325
07:45 AM	**9**	**20**	**11**	12	**52**	18	**72**	**32**	6	**128**	**34**	**29**	9	6	**78**	9	**91**	36	0	**136**	**394**
Total Volume	22	63	27	28	140	74	174	79	21	348	105	91	42	22	260	49	275	149	0	473	1221
% App. Total	15.7	45	19.3	20		21.3	50	22.7	6		40.4	35	16.2	8.5		10.4	58.1	31.5	0		
PHF	.611	.788	.614	.538	.673	.617	.604	.617	.477	.680	.772	.784	.750	.611	.833	.681	.755	.909	.000	.869	.775
Passenger Vehicles	21	61	24	28	134	74	162	77	21	334	97	87	40	22	246	46	264	145	0	455	1169
% Passenger Vehicles	95.5	96.8	88.9	100	95.7	100	93.1	97.5	100	96.0	92.4	95.6	95.2	100	94.6	93.9	96.0	97.3	0	96.2	95.7
Trucks	0	1	0	0	1	0	6	0	0	6	6	4	1	0	11	2	1	3	0	6	24
% Trucks	0	1.6	0	0	0.7	0	3.4	0	0	1.7	5.7	4.4	2.4	0	4.2	4.1	0.4	2.0	0	1.3	2.0
Buses	1	1	3	0	5	0	6	2	0	8	2	0	1	0	3	1	10	1	0	12	28
% Buses	4.5	1.6	11.1	0	3.6	0	3.4	2.5	0	2.3	1.9	0	2.4	0	1.2	2.0	3.6	0.7	0	2.5	2.3



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Bedford at Memorial Plaza
November 1, 2017
3:00 - 6:00 PM

File Name : Bedford_Memorial PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Memorial Plaza From North					Bedford Road From East					Marble Ave From South					Bedford Road From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	5	28	11	11	55	17	61	18	7	103	37	33	17	10	97	17	51	25	2	95	350
03:15 PM	4	24	11	5	44	24	110	16	5	155	69	37	15	10	131	22	56	34	5	117	447
03:30 PM	6	14	7	7	34	17	71	24	0	112	71	27	15	6	119	24	57	44	5	130	395
03:45 PM	4	18	11	3	36	25	85	17	3	130	62	33	8	6	109	22	58	39	1	120	395
Total	19	84	40	26	169	83	327	75	15	500	239	130	55	32	456	85	222	142	13	462	1587
04:00 PM	4	22	11	17	54	29	86	35	2	152	48	42	14	3	107	21	44	34	2	101	414
04:15 PM	6	16	14	3	39	14	96	16	3	129	80	38	12	2	132	21	52	36	0	109	409
04:30 PM	5	22	14	10	51	14	66	18	2	100	71	32	16	4	123	27	66	22	3	118	392
04:45 PM	13	24	16	10	63	19	80	26	0	125	62	44	12	21	139	26	59	26	5	116	443
Total	28	84	55	40	207	76	328	95	7	506	261	156	54	30	501	95	221	118	10	444	1658
05:00 PM	4	8	9	14	35	23	88	21	4	136	84	47	11	8	150	29	46	23	5	103	424
05:15 PM	3	25	16	6	50	15	93	14	6	128	72	50	18	5	145	20	45	22	1	88	411
05:30 PM	2	11	7	8	28	22	97	19	3	141	81	49	17	8	155	24	52	21	2	99	423
05:45 PM	2	26	2	2	32	16	67	21	7	111	91	51	20	6	168	28	43	37	0	108	419
Total	11	70	34	30	145	76	345	75	20	516	328	197	66	27	618	101	186	103	8	398	1677
Grand Total	58	238	129	96	521	235	1000	245	42	1522	828	483	175	89	1575	281	629	363	31	1304	4922
Apprch %	11.1	45.7	24.8	18.4		15.4	65.7	16.1	2.8		52.6	30.7	11.1	5.7		21.5	48.2	27.8	2.4		
Total %	1.2	4.8	2.6	2	10.6	4.8	20.3	5	0.9	30.9	16.8	9.8	3.6	1.8	32	5.7	12.8	7.4	0.6	26.5	
Passenger Vehicles	53	228	119	96	496	229	973	237	42	1481	821	471	169	89	1550	275	606	345	31	1257	4784
% Passenger Vehicles	91.4	95.8	92.2	100	95.2	97.4	97.3	96.7	100	97.3	99.2	97.5	96.6	100	98.4	97.9	96.3	95	100	96.4	97.2
Trucks	4	9	6	0	19	5	9	7	0	21	0	8	6	0	14	3	9	14	0	26	80
% Trucks	6.9	3.8	4.7	0	3.6	2.1	0.9	2.9	0	1.4	0	1.7	3.4	0	0.9	1.1	1.4	3.9	0	2	1.6
Buses	1	1	4	0	6	1	18	1	0	20	7	4	0	0	11	3	14	4	0	21	58
% Buses	1.7	0.4	3.1	0	1.2	0.4	1.8	0.4	0	1.3	0.8	0.8	0	0	0.7	1.1	2.2	1.1	0	1.6	1.2

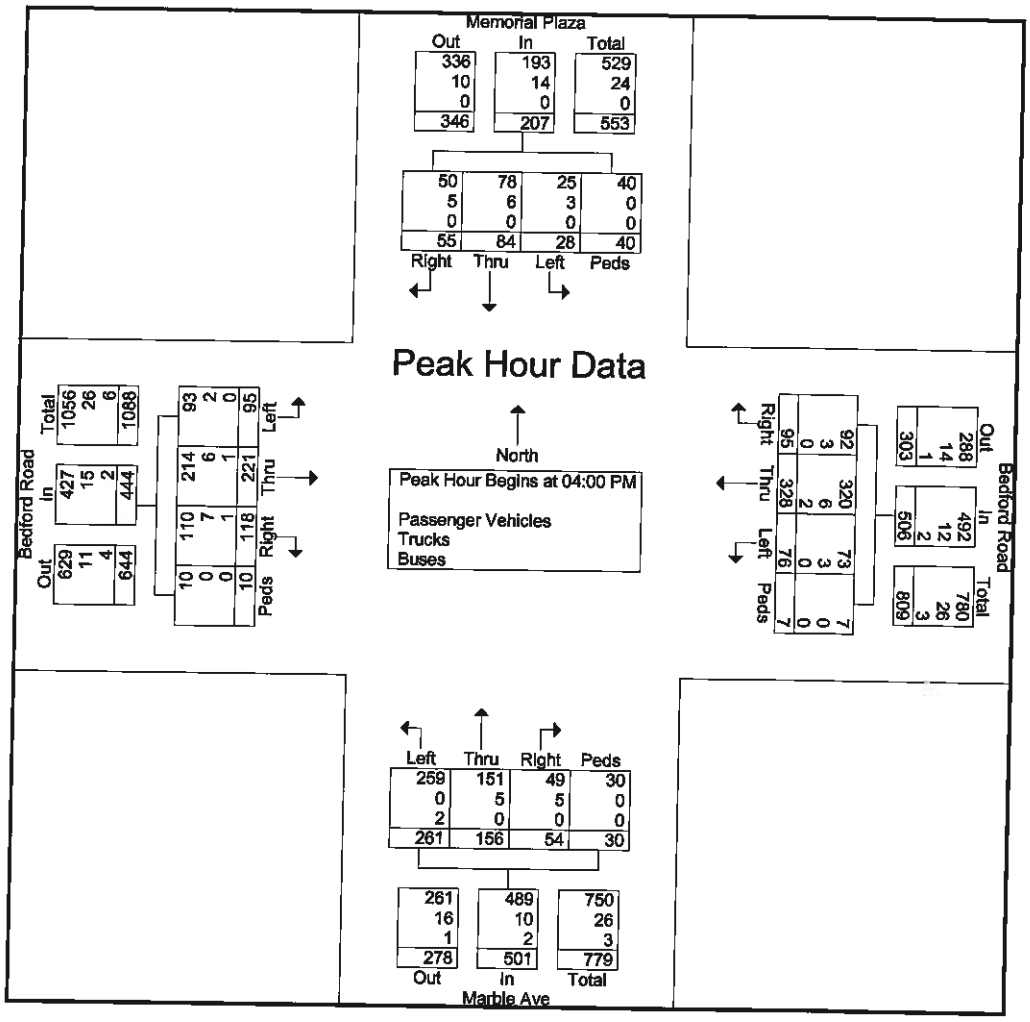
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Bedford at Memorial Plaza
November 1, 2017
3:00 - 6:00 PM

File Name : Bedford_Memorial PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Memorial Plaza From North					Bedford Road From East					Marble Ave From South					Bedford Road From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 04:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	4	22	11	**17**	54	**29**	86	**35**	2	**152**	48	42	14	3	107	21	44	34	2	101	414
04:15 PM	6	16	14	3	39	14	**96**	16	**3**	129	**80**	38	12	2	132	21	52	**36**	0	109	409
04:30 PM	5	22	14	10	51	14	66	18	2	100	71	32	**16**	4	123	**27**	**66**	22	3	**118**	392
04:45 PM	**13**	**24**	**16**	10	**63**	19	80	26	0	125	62	**44**	12	**21**	**139**	26	59	26	**5**	116	**443**
Total Volume	28	84	55	40	207	76	328	95	7	506	261	156	54	30	501	95	221	118	10	444	1658
% App. Total	13.5	40.6	26.6	19.3		15	64.8	18.8	1.4		52.1	31.1	10.8	6		21.4	49.8	26.6	2.3		
PHF	.538	.875	.859	.588	.821	.655	.854	.679	.583	.832	.816	.886	.844	.357	.901	.880	.837	.819	.500	.941	.936
Passenger Vehicles	25	78	50	40	193	73	320	92	7	492	259	151	49	30	489	93	214	110	10	427	1601
% Passenger Vehicles	89.3	92.9	90.9	100	93.2	96.1	97.6	96.8	100	97.2	99.2	96.8	90.7	100	97.6	97.9	96.8	93.2	100	96.2	96.6
Trucks	3	6	5	0	14	3	6	3	0	12	0	5	5	0	10	2	6	7	0	15	51
% Trucks	10.7	7.1	9.1	0	6.8	3.9	1.8	3.2	0	2.4	0	3.2	9.3	0	2.0	2.1	2.7	5.9	0	3.4	3.1
Buses	0	0	0	0	0	0	2	0	0	2	2	0	0	0	2	0	1	1	0	2	6
% Buses	0	0	0	0	0	0	0.6	0	0	0.4	0.8	0	0	0	0.4	0	0.5	0.8	0	0.5	0.4



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Memorial
November 7, 2018
7:00 - 9:00 AM

File Name : Manville_Memorial
Site Code : 17-308
Start Date : 11/7/2018
Page No : 1

Groups Printed- Passenger Vehicles - Buses - Trucks

	Grant St From North					Manville Rd From East					Memorial Plaza From South					Manville Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	7	9	0	17	14	28	7	0	49	17	10	2	0	29	11	47	12	0	70	165
07:15 AM	0	6	14	0	20	23	35	16	2	76	24	25	10	0	59	21	57	21	1	100	255
07:30 AM	0	17	24	0	41	16	44	17	4	81	17	20	4	0	41	9	86	13	1	109	272
07:45 AM	0	26	29	0	55	15	55	23	4	97	15	19	11	0	45	12	100	12	0	124	321
Total	1	56	76	0	133	68	162	63	10	303	73	74	27	0	174	53	290	58	2	403	1013
08:00 AM	2	14	30	0	46	25	32	19	2	78	22	18	8	0	48	8	72	15	2	97	269
08:15 AM	1	6	20	0	27	19	48	22	2	91	15	24	10	0	49	14	78	25	0	117	284
08:30 AM	3	6	13	0	22	16	40	11	1	68	17	22	5	2	46	10	64	23	1	98	234
08:45 AM	1	1	23	0	25	23	49	14	2	88	17	19	6	0	42	14	69	18	1	102	257
Total	7	27	86	0	120	83	169	66	7	325	71	83	29	2	185	46	283	81	4	414	1044
Grand Total	8	83	162	0	253	151	331	129	17	628	144	157	56	2	359	99	573	139	6	817	2057
Apprch %	3.2	32.8	64	0		24	52.7	20.5	2.7		40.1	43.7	15.6	0.6		12.1	70.1	17	0.7		
Total %	0.4	4	7.9	0	12.3	7.3	16.1	6.3	0.8	30.5	7	7.6	2.7	0.1	17.5	4.8	27.9	6.8	0.3	39.7	
Passenger Vehicles	8	82	162	0	252	151	320	125	17	613	139	154	55	2	350	96	548	138	6	788	2003
% Passenger Vehicles	100	98.8	100	0	99.6	100	96.7	96.9	100	97.6	96.5	98.1	98.2	100	97.5	97	95.6	99.3	100	96.5	97.4
Buses	0	1	0	0	1	0	4	2	0	6	0	3	1	0	4	3	12	1	0	16	27
% Buses	0	1.2	0	0	0.4	0	1.2	1.6	0	1	0	1.9	1.8	0	1.1	3	2.1	0.7	0	2	1.3
Trucks	0	0	0	0	0	0	7	2	0	9	5	0	0	0	5	0	13	0	0	13	27
% Trucks	0	0	0	0	0	0	2.1	1.6	0	1.4	3.5	0	0	0	1.4	0	2.3	0	0	1.6	1.3

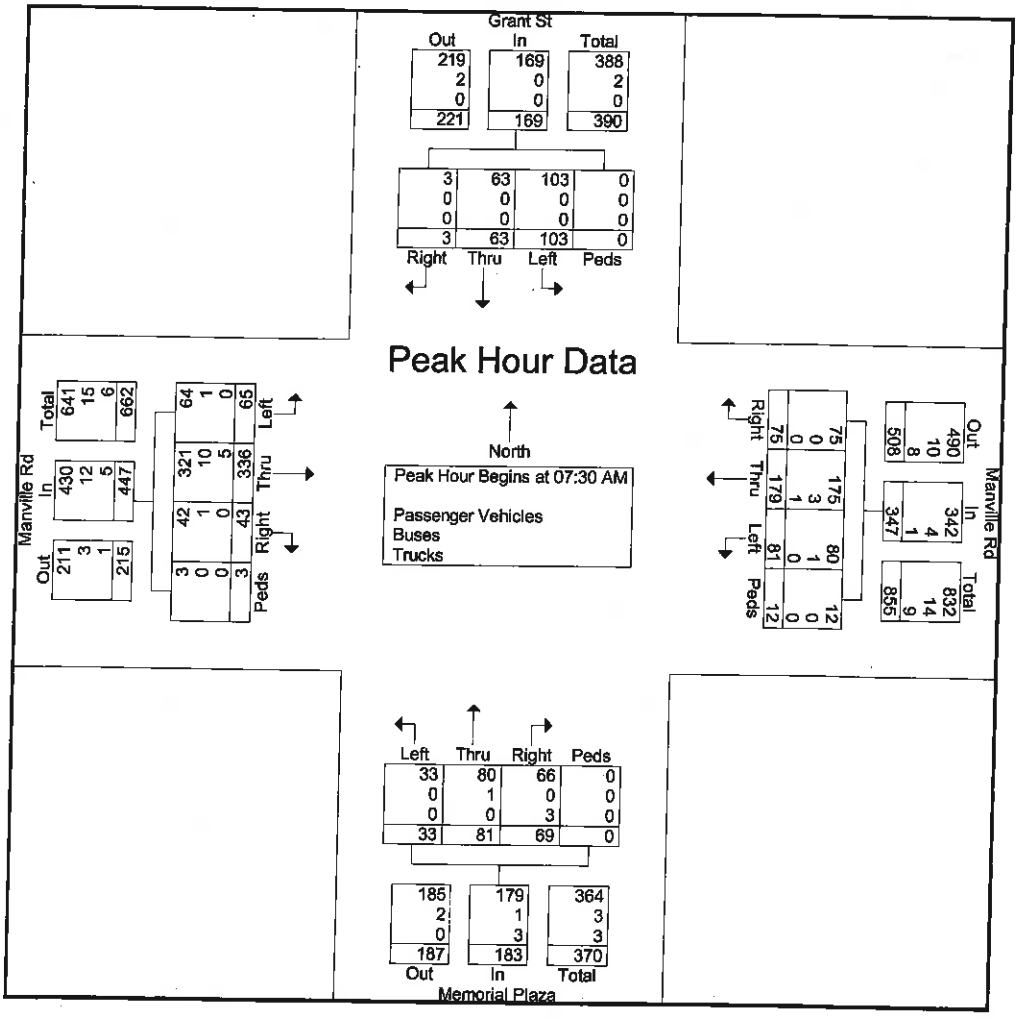
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Memorial
November 7, 2018
7:00 - 9:00 AM

File Name : Manville_Memorial
Site Code : 17-308
Start Date : 11/7/2018
Page No : 2

	Grant St From North					Manville Rd From East					Memorial Plaza From South					Manville Rd From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	17	24	0	41	16	44	17	4	81	17	20	4	0	41	9	86	13	1	109	272
07:45 AM	0	**26**	29	0	**55**	15	**55**	**23**	4	**97**	15	19	**11**	0	45	12	**100**	12	0	**124**	**321**
08:00 AM	**2**	14	**30**	0	46	**25**	32	19	2	78	**22**	18	8	0	48	8	72	15	**2**	97	269
08:15 AM	1	6	20	0	27	19	48	22	2	91	15	**24**	10	0	**49**	**14**	78	**25**	0	117	284
Total Volume	3	63	103	0	169	75	179	81	12	347	69	81	33	0	183	43	336	65	3	447	1146
% App. Total	1.8	37.3	60.9	0		21.6	51.6	23.3	3.5		37.7	44.3	18	0		9.6	75.2	14.5	0.7		
PHF	.375	.606	.858	.000	.768	.750	.814	.880	.750	.894	.784	.844	.750	.000	.934	.768	.840	.650	.375	.901	.893
Passenger Vehicles	3	63	103	0	169	75	175	80	12	342	66	80	33	0	179	42	321	64	3	430	1120
% Passenger Vehicles	100	100	100	0	100	100	97.8	98.8	100	98.6	95.7	98.8	100	0	97.8	97.7	95.5	98.5	100	96.2	97.7
Buses	0	0	0	0	0	0	3	1	0	4	0	1	0	0	1	1	10	1	0	12	17
% Buses	0	0	0	0	0	0	1.7	1.2	0	1.2	0	1.2	0	0	0.5	2.3	3.0	1.5	0	2.7	1.5
Trucks	0	0	0	0	0	0	1	0	0	1	3	0	0	0	3	0	5	0	0	5	9
% Trucks	0	0	0	0	0	0	0.6	0	0	0.3	4.3	0	0	0	1.6	0	1.5	0	0	1.1	0.8



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Memorial
November 7, 2018
16:00 - 19:00

File Name : manville_memorial pm
Site Code : 17-308
Start Date : 11/7/2018
Page No : 1

Groups Printed- Passenger Vehicles - Buses - Trucks

	Grant St From North					Manville Rd From East					Memorial Plaza From South					Manville Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
04:00 PM	17	6	0	1	24	15	70	36	3	124	10	33	42	0	85	31	48	8	0	87	320
04:15 PM	14	7	2	0	23	18	82	32	3	135	9	37	41	0	87	43	62	15	0	120	365
04:30 PM	13	12	1	3	29	20	66	20	4	110	11	37	42	1	91	26	60	12	2	100	330
04:45 PM	16	4	3	4	27	26	63	49	0	138	8	29	47	4	88	34	65	10	0	109	362
Total	60	29	6	8	103	79	281	137	10	507	38	136	172	5	351	134	235	45	2	416	1377
05:00 PM	13	6	1	2	22	17	56	42	1	116	11	39	48	3	101	37	46	10	1	94	333
05:15 PM	18	6	2	4	30	19	67	32	3	121	11	29	37	1	78	40	66	11	0	117	346
05:30 PM	19	10	0	3	32	21	68	33	3	125	12	26	35	1	74	32	53	11	2	98	329
05:45 PM	21	4	2	4	31	29	63	19	4	115	6	28	32	4	70	47	67	9	3	126	342
Total	71	26	5	13	115	86	254	126	11	477	40	122	152	9	323	156	232	41	6	435	1350
06:00 PM	11	4	1	1	17	14	58	33	1	106	13	31	45	0	89	30	49	8	1	88	300
06:15 PM	13	8	1	1	23	21	44	20	3	88	13	28	46	1	88	35	36	16	2	89	288
06:30 PM	12	4	2	1	19	17	52	16	5	90	15	14	54	1	84	22	33	12	2	69	262
06:45 PM	15	8	1	1	25	12	41	18	2	73	11	18	25	2	56	26	43	9	0	78	232
Total	51	24	5	4	84	64	195	87	11	357	52	91	170	4	317	113	161	45	5	324	1082
Grand Total	182	79	16	25	302	229	730	350	32	1341	130	349	494	18	991	403	628	131	13	1175	3809
Apprch %	60.3	26.2	5.3	8.3		17.1	54.4	26.1	2.4		13.1	35.2	49.8	1.8		34.3	53.4	11.1	1.1		
Total %	4.8	2.1	0.4	0.7	7.9	6	19.2	9.2	0.8	35.2	3.4	9.2	13	0.5	26	10.6	16.5	3.4	0.3	30.8	
Passenger Vehicles	182	79	16	25	302	226	711	350	32	1319	122	349	494	18	983	402	622	122	13	1159	3763
% Passenger Vehicles	100	100	100	100	100	98.7	97.4	100	100	98.4	93.8	100	100	100	99.2	99.8	99	93.1	100	98.6	98.8
Buses	0	0	0	0	0	0	4	0	0	4	3	0	0	0	3	1	1	9	0	11	18
% Buses	0	0	0	0	0	0	0.5	0	0	0.3	2.3	0	0	0	0.3	0.2	0.2	6.9	0	0.9	0.5
Trucks	0	0	0	0	0	3	15	0	0	18	5	0	0	0	5	0	5	0	0	5	28
% Trucks	0	0	0	0	0	1.3	2.1	0	0	1.3	3.8	0	0	0	0.5	0	0.8	0	0	0.4	0.7

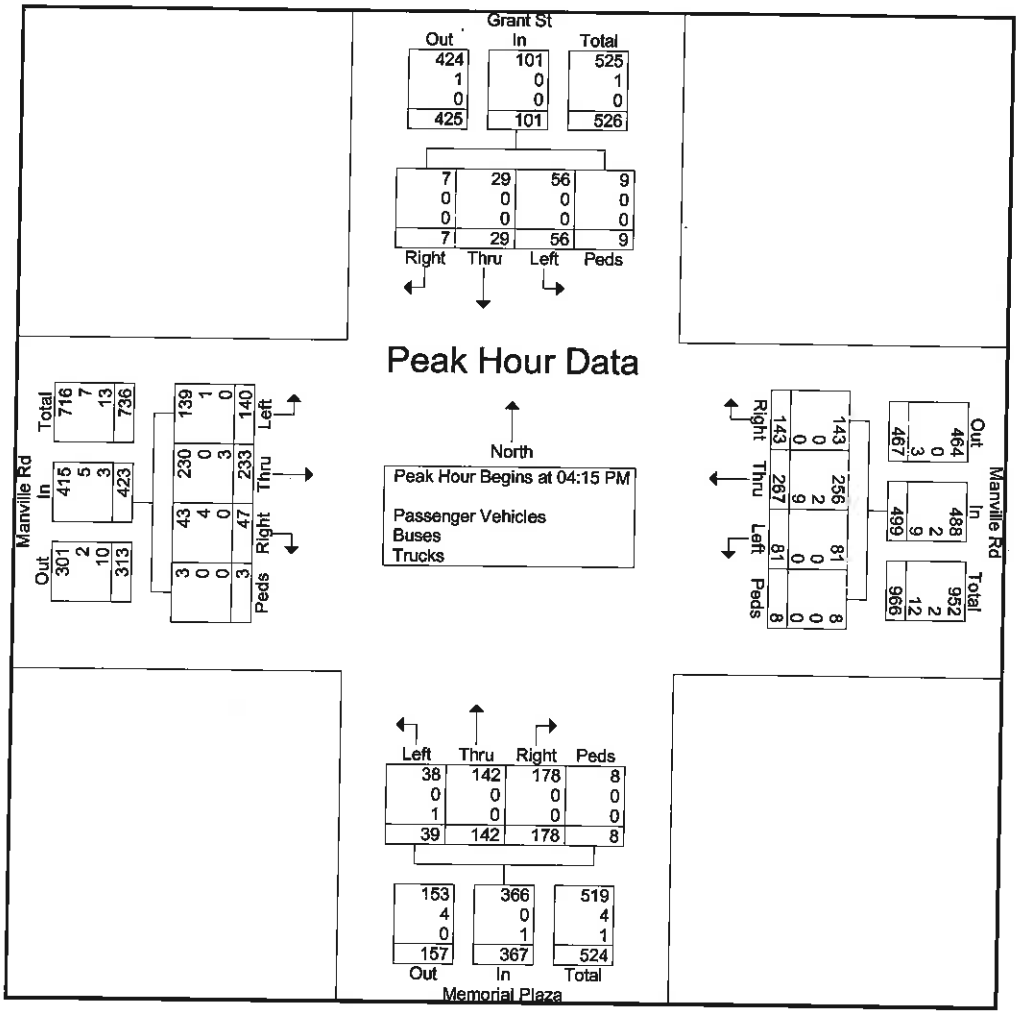
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Memorial
November 7, 2018
16:00 - 19:00

File Name : manville_memorial pm
Site Code : 17-308
Start Date : 11/7/2018
Page No : 2

	Grant St From North					Manville Rd From East					Memorial Plaza From South					Manville Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	14	7	2	0	23	18	**82**	32	3	135	9	37	41	0	87	**43**	62	**15**	0	**120**	**365**
04:30 PM	13	**12**	1	3	**29**	20	66	20	**4**	110	**11**	37	42	1	91	26	60	12	**2**	100	330
04:45 PM	**16**	4	**3**	**4**	27	**26**	63	**49**	0	**138**	8	29	47	**4**	88	34	**65**	10	0	109	362
05:00 PM	13	6	1	2	22	17	56	42	1	116	11	**39**	**48**	3	**101**	37	46	10	1	94	333
Total Volume	56	29	7	9	101	81	267	143	8	499	39	142	178	8	367	140	233	47	3	423	1390
% App. Total	55.4	28.7	6.9	8.9		16.2	53.5	28.7	1.6		10.6	38.7	48.5	2.2		33.1	55.1	11.1	0.7		
PHF	.875	.604	.583	.563	.871	.779	.814	.730	.500	.904	.886	.910	.927	.500	.908	.814	.896	.783	.375	.881	.952
Passenger Vehicles	56	29	7	9	101	81	256	143	8	488	38	142	178	8	366	139	230	43	3	415	1370
% Passenger Vehicles	100	100	100	100	100	100	95.9	100	100	97.8	97.4	100	100	100	99.7	99.3	98.7	91.5	100	98.1	98.6
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	4	0	5	7
% Buses	0	0	0	0	0	0	0.7	0	0	0.4	0	0	0	0	0	0.7	0	8.5	0	1.2	0.5
Trucks	0	0	0	0	0	0	9	0	0	9	1	0	0	0	1	0	3	0	0	3	13
% Trucks	0	0	0	0	0	0	3.4	0	0	1.8	2.6	0	0	0	0.3	0	1.3	0	0	0.7	0.9



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Memorial
November 7, 2018
16:00 - 19:00

File Name : manville_memorial pm slip ramp
Site Code : 17-308
Start Date : 11/7/2018
Page No : 1

Groups Printed- Passenger Vehicles - Buses - Trucks

	Permitte Parking From East		Memorial Plaza From South		
Start Time	Right	App. Total	Right	App. Total	Int. Total
04:00 PM	12	12	27	27	39
04:15 PM	11	11	30	30	41
04:30 PM	11	11	29	29	40
04:45 PM	16	16	30	30	46
Total	50	50	116	116	166
05:00 PM	9	9	38	38	47
05:15 PM	12	12	24	24	36
05:30 PM	10	10	24	24	34
05:45 PM	5	5	27	27	32
Total	36	36	113	113	149
06:00 PM	21	21	23	23	44
06:15 PM	19	19	27	27	46
06:30 PM	23	23	31	31	54
06:45 PM	2	2	23	23	25
Total	65	65	104	104	169
Grand Total	151	151	333	333	484
Apprch %	100		100		
Total %	31.2	31.2	68.8	68.8	
Passenger Vehicles	151	151	333	333	484
% Passenger Vehicles	100	100	100	100	100
Buses	0	0	0	0	0
% Buses	0	0	0	0	0
Trucks	0	0	0	0	0
% Trucks	0	0	0	0	0

	Permitte Parking From East		Memorial Plaza From South		
Start Time	Right	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 05:45 PM					
05:45 PM	5	5	27	27	32
06:00 PM	21	21	23	23	44
06:15 PM	19	19	27	27	46
06:30 PM	**23**	**23**	**31**	**31**	**54**
Total Volume	68	68	108	108	176
% App. Total	100		100		
PHF	.739	.739	.871	.871	.815
Passenger Vehicles	68	68	108	108	176
% Passenger Vehicles	100	100	100	100	100
Buses	0	0	0	0	0
% Buses	0	0	0	0	0
Trucks	0	0	0	0	0
% Trucks	0	0	0	0	0

HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Wheeler
November 1, 2017
6:00 - 8:00 AM

File Name : Manville_Wheeler AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Parking Lot From North					Manville Rd From East					Wheeler Ave From South					Manville Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	0	0	0	0	7	18	0	0	25	0	0	0	0	0	2	15	4	1	22	47
06:15 AM	0	0	1	0	1	13	28	0	1	42	0	0	0	1	1	1	18	7	1	27	71
06:30 AM	0	0	2	0	2	8	38	1	0	47	0	0	0	1	1	4	34	15	1	54	104
06:45 AM	0	0	2	0	2	12	50	1	0	63	0	0	0	0	0	1	39	10	2	52	117
Total	0	0	5	0	5	40	134	2	1	177	0	0	0	2	2	8	106	36	5	155	339
07:00 AM	0	0	3	0	3	17	67	1	3	88	0	0	0	0	0	3	47	32	0	82	173
07:15 AM	2	0	1	0	3	22	77	0	3	102	0	0	0	0	0	2	94	24	1	121	226
07:30 AM	1	1	0	0	2	12	77	2	4	95	0	0	0	0	0	2	128	17	3	150	247
Grand Total	3	1	9	0	13	91	355	5	11	462	0	0	0	2	2	15	375	109	9	508	985
Apprch %	23.1	7.7	69.2	0		19.7	76.8	1.1	2.4		0	0	0	100		3	73.8	21.5	1.8		
Total %	0.3	0.1	0.9	0	1.3	9.2	36	0.5	1.1	46.9	0	0	0	0.2	0.2	1.5	38.1	11.1	0.9	51.6	
Passenger Vehicles	3	1	9	0	13	89	346	5	11	451	0	0	0	2	2	15	347	104	9	475	941
% Passenger Vehicles	100	100	100	0	100	97.8	97.5	100	100	97.6	0	0	0	100	100	100	92.5	95.4	100	93.5	95.5
Trucks	0	0	0	0	0	2	6	0	0	8	0	0	0	0	0	0	23	4	0	27	35
% Trucks	0	0	0	0	0	2.2	1.7	0	0	1.7	0	0	0	0	0	0	6.1	3.7	0	5.3	3.6
Buses	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	1	0	6	9
% Buses	0	0	0	0	0	0	0.8	0	0	0.6	0	0	0	0	0	0	1.3	0.9	0	1.2	0.9

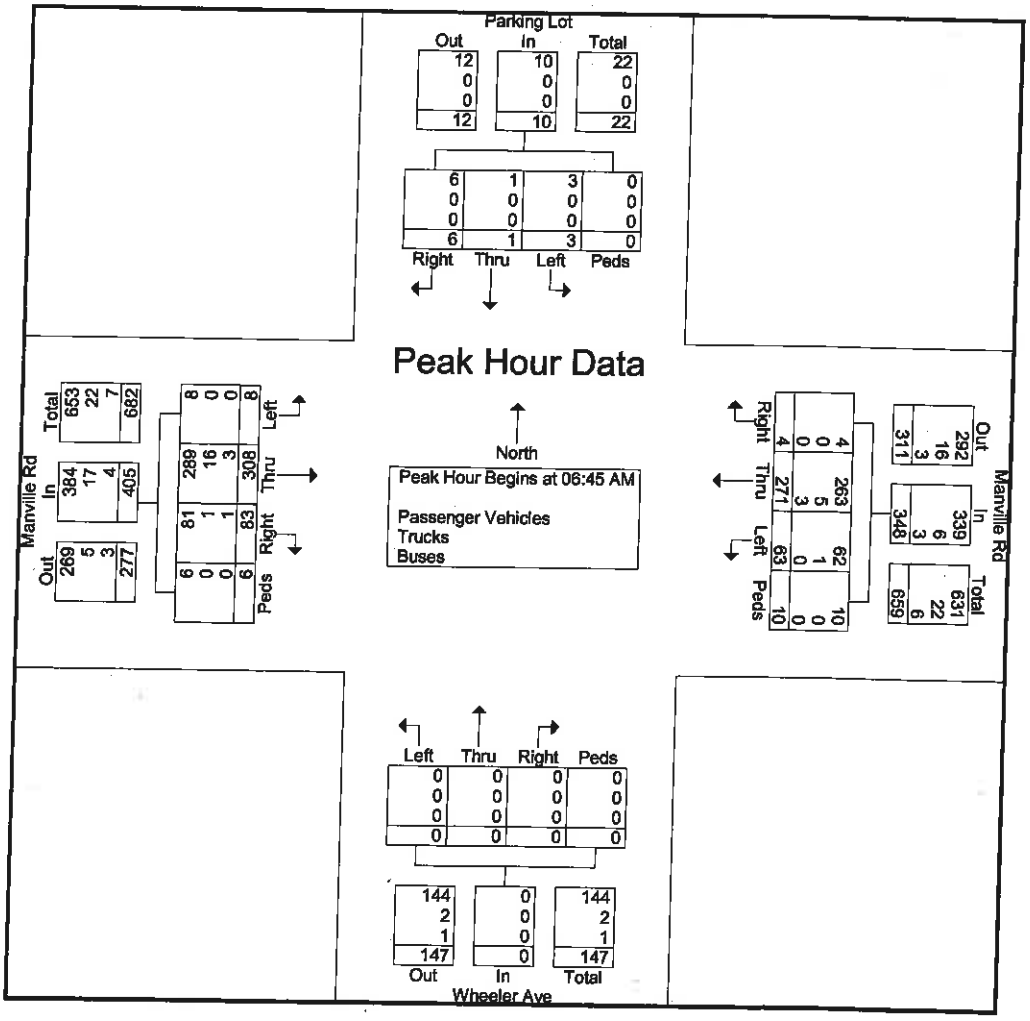
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Wheeler
November 1, 2017
6:00 - 8:00 AM

File Name : Manville_Wheeler AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Parking Lot From North					Manville Rd From East					Wheeler Ave From South					Manville Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:30 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	0	0	2	0	2	12	50	1	0	63	0	0	0	0	0	1	39	10	2	52	117
07:00 AM	0	0	**3**	0	**3**	17	67	1	3	88	0	0	0	0	0	**3**	47	**32**	0	82	173
07:15 AM	**2**	0	1	0	3	**22**	**77**	0	3	**102**	0	0	0	0	0	2	94	24	1	121	226
07:30 AM	1	**1**	0	0	2	12	77	**2**	**4**	95	0	0	0	0	0	2	**128**	17	**3**	**150**	**247**
Total Volume	3	1	6	0	10	63	271	4	10	348	0	0	0	0	0	8	308	83	6	405	763
% App. Total	30	10	60	0		18.1	77.9	1.1	2.9		0	0	0	0		2	76	20.5	1.5		
PHF	.375	.250	.500	.000	.833	.716	.880	.500	.625	.853	.000	.000	.000	.000	.000	.667	.602	.648	.500	.675	.772
Passenger Vehicles	3	1	6	0	10	62	263	4	10	339	0	0	0	0	0	8	289	81	6	384	733
% Passenger Vehicles	100	100	100	0	100	98.4	97.0	100	100	97.4	0	0	0	0	0	100	93.8	97.6	100	94.8	96.1
Trucks	0	0	0	0	0	1	5	0	0	6	0	0	0	0	0	0	16	1	0	17	23
% Trucks	0	0	0	0	0	1.6	1.8	0	0	1.7	0	0	0	0	0	0	5.2	1.2	0	4.2	3.0
Buses	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	3	1	0	4	7
% Buses	0	0	0	0	0	0	1.1	0	0	0.9	0	0	0	0	0	0	1.0	1.2	0	1.0	0.9



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Wheeler
November 1, 2017
3:00 - 6:00 PM

File Name : Manville_Wheeler PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Parking Lot From North					Manville Rd From East					Wheeler Ave From South					Manville Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	0	0	3	0	3	11	141	1	2	155	0	0	0	0	0	1	81	23	2	107	265
03:15 PM	0	0	0	0	0	21	118	0	5	144	0	0	0	0	0	2	77	25	1	105	249
03:30 PM	3	0	3	0	6	20	92	1	5	118	0	0	0	0	0	5	77	11	2	95	219
03:45 PM	0	0	3	0	3	8	114	2	4	128	0	0	0	0	0	1	84	34	2	121	252
Total	3	0	9	0	12	60	465	4	16	545	0	0	0	0	0	9	319	93	7	428	985
04:00 PM	0	0	13	0	13	12	116	3	7	138	0	0	0	0	0	6	67	31	0	104	255
04:15 PM	0	0	6	0	6	11	111	1	2	125	0	0	0	0	0	3	85	23	2	113	244
04:30 PM	0	0	3	0	3	12	102	1	5	120	0	0	0	0	0	3	78	24	0	105	228
04:45 PM	0	0	2	0	2	15	112	1	6	134	0	0	0	0	0	5	97	20	2	124	260
Total	0	0	24	0	24	50	441	6	20	517	0	0	0	0	0	17	327	98	4	446	987
05:00 PM	1	0	3	0	4	10	119	1	3	133	0	0	0	0	0	6	82	22	1	111	248
05:15 PM	0	1	6	0	7	10	112	0	6	128	0	0	0	0	0	6	100	23	0	129	264
05:30 PM	0	0	2	0	2	10	92	1	6	109	0	0	0	0	0	3	89	24	2	118	229
05:45 PM	0	0	2	0	2	12	97	1	5	115	0	0	0	0	0	5	82	26	0	113	230
Total	1	1	13	0	15	42	420	3	20	485	0	0	0	0	0	20	353	95	3	471	971
Grand Total	4	1	46	0	51	152	1326	13	56	1547	0	0	0	0	0	46	999	286	14	1345	2943
Apprch %	7.8	2	90.2	0		9.8	85.7	0.8	3.6		0	0	0	0		3.4	74.3	21.3	1		
Total %	0.1	0	1.6	0	1.7	5.2	45.1	0.4	1.9	52.6	0	0	0	0	0	1.6	33.9	9.7	0.5	45.7	
Passenger Vehicles	4	1	46	0	51	152	1281	13	56	1502	0	0	0	0	0	46	964	283	14	1307	2860
% Passenger Vehicles	100	100	100	0	100	100	96.6	100	100	97.1	0	0	0	0	0	100	96.5	99	100	97.2	97.2
Trucks	0	0	0	0	0	0	35	0	0	35	0	0	0	0	0	0	26	1	0	27	62
% Trucks	0	0	0	0	0	0	2.6	0	0	2.3	0	0	0	0	0	0	2.6	0.3	0	2	2.1
Buses	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	0	9	2	0	11	21
% Buses	0	0	0	0	0	0	0.8	0	0	0.6	0	0	0	0	0	0	0.9	0.7	0	0.8	0.7

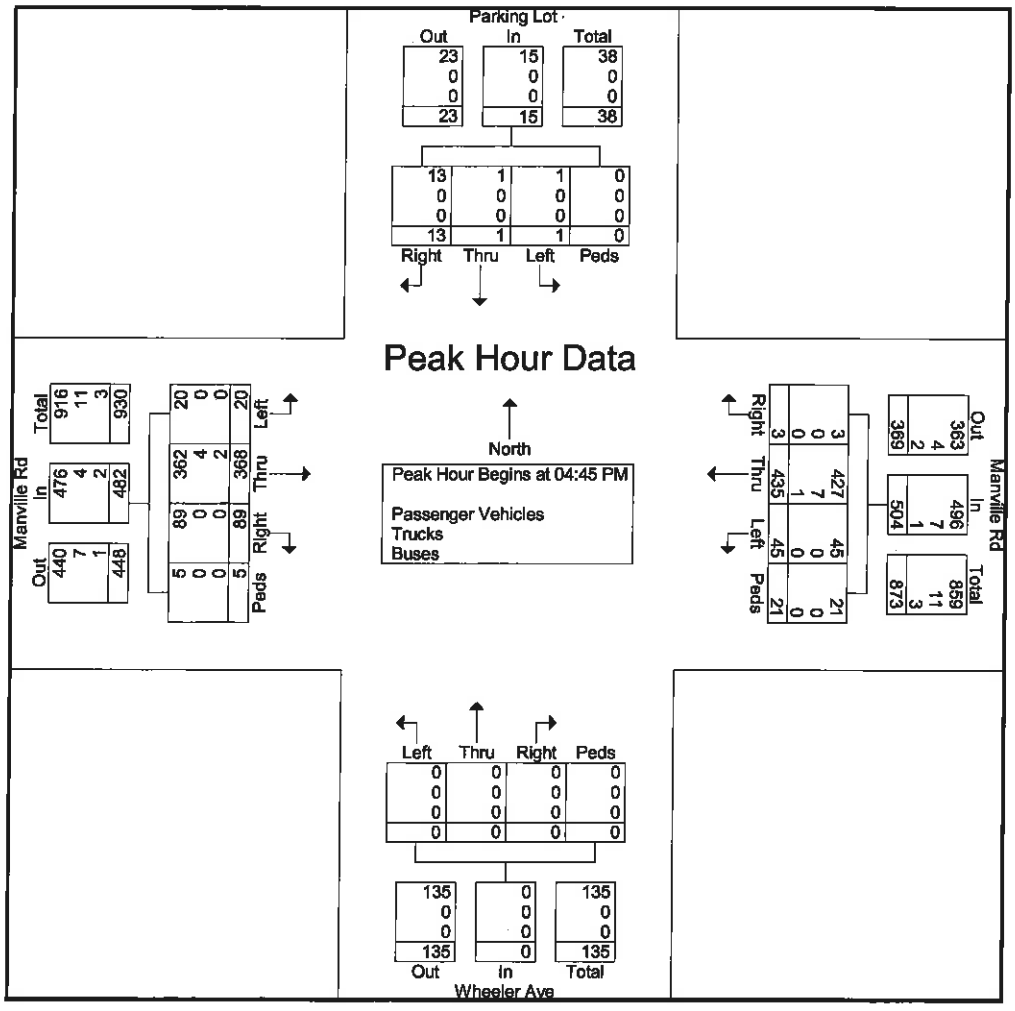
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Wheeler
November 1, 2017
3:00 - 6:00 PM

File Name : Manville_Wheeler PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Parking Lot From North					Manville Rd From East					Wheeler Ave From South					Manville Rd From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	2	0	2	**15**	112	1	**6**	**134**	0	0	0	0	0	5	97	20	**2**	124	260
05:00 PM	1	0	3	0	4	10	**119**	1	3	133	0	0	0	0	0	**6**	82	22	1	111	248
05:15 PM	0	**1**	**6**	0	**7**	10	112	0	6	128	0	0	0	0	0	6	**100**	23	0	**129**	**264**
05:30 PM	0	0	2	0	2	10	92	1	6	109	0	0	0	0	0	3	89	**24**	2	118	229
Total Volume	1	1	13	0	15	45	435	3	21	504	0	0	0	0	0	20	368	89	5	482	1001
% App. Total	6.7	6.7	86.7	0		8.9	86.3	0.6	4.2		0	0	0	0		4.1	76.3	18.5	1		
PHF	.250	.250	.542	.000	.536	.750	.914	.750	.875	.940	.000	.000	.000	.000	.000	.833	.920	.927	.625	.934	.948
Passenger Vehicles	1	1	13	0	15	45	427	3	21	496	0	0	0	0	0	20	362	89	5	476	987
% Passenger Vehicles	100	100	100	0	100	100	98.2	100	100	98.4	0	0	0	0	0	100	98.4	100	100	98.8	98.6
Trucks	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	4	0	0	4	11
% Trucks	0	0	0	0	0	0	1.6	0	0	1.4	0	0	0	0	0	0	1.1	0	0	0.8	1.1
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	3
% Buses	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0.5	0	0	0.4	0.3



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Washington
November 1, 2017
6:00 - 8:00 PM

File Name : Manville_Washington AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Washington Ave From North				Manville Rd From East				Manville Rd From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
06:00 AM	1	20	0	21	10	3	0	13	4	2	2	8	42
06:15 AM	4	10	0	14	17	5	0	22	12	7	2	21	57
06:30 AM	2	12	0	14	24	5	0	29	2	11	2	15	58
06:45 AM	2	18	0	20	32	3	0	35	15	22	3	40	95
Total	9	60	0	69	83	16	0	99	33	42	9	84	252
07:00 AM	4	29	0	33	38	3	0	41	11	29	2	42	116
07:15 AM	4	41	0	45	52	8	0	60	12	38	4	54	159
07:30 AM	2	35	0	37	54	5	0	59	23	83	4	110	206
07:45 AM	9	29	0	38	64	9	0	73	35	95	6	136	247
Total	19	134	0	153	208	25	0	233	81	245	16	342	728
Grand Total	28	194	0	222	291	41	0	332	114	287	25	426	980
Apprch %	12.6	87.4	0		87.7	12.3	0		26.8	67.4	5.9		
Total %	2.9	19.8	0	22.7	29.7	4.2	0	33.9	11.6	29.3	2.6	43.5	
Passenger Vehicles	27	190	0	217	281	40	0	321	106	265	25	396	934
% Passenger Vehicles	96.4	97.9	0	97.7	96.6	97.6	0	96.7	93	92.3	100	93	95.3
Trucks	1	4	0	5	6	1	0	7	7	18	0	25	37
% Trucks	3.6	2.1	0	2.3	2.1	2.4	0	2.1	6.1	6.3	0	5.9	3.8
Buses	0	0	0	0	4	0	0	4	1	4	0	5	9
% Buses	0	0	0	0	1.4	0	0	1.2	0.9	1.4	0	1.2	0.9

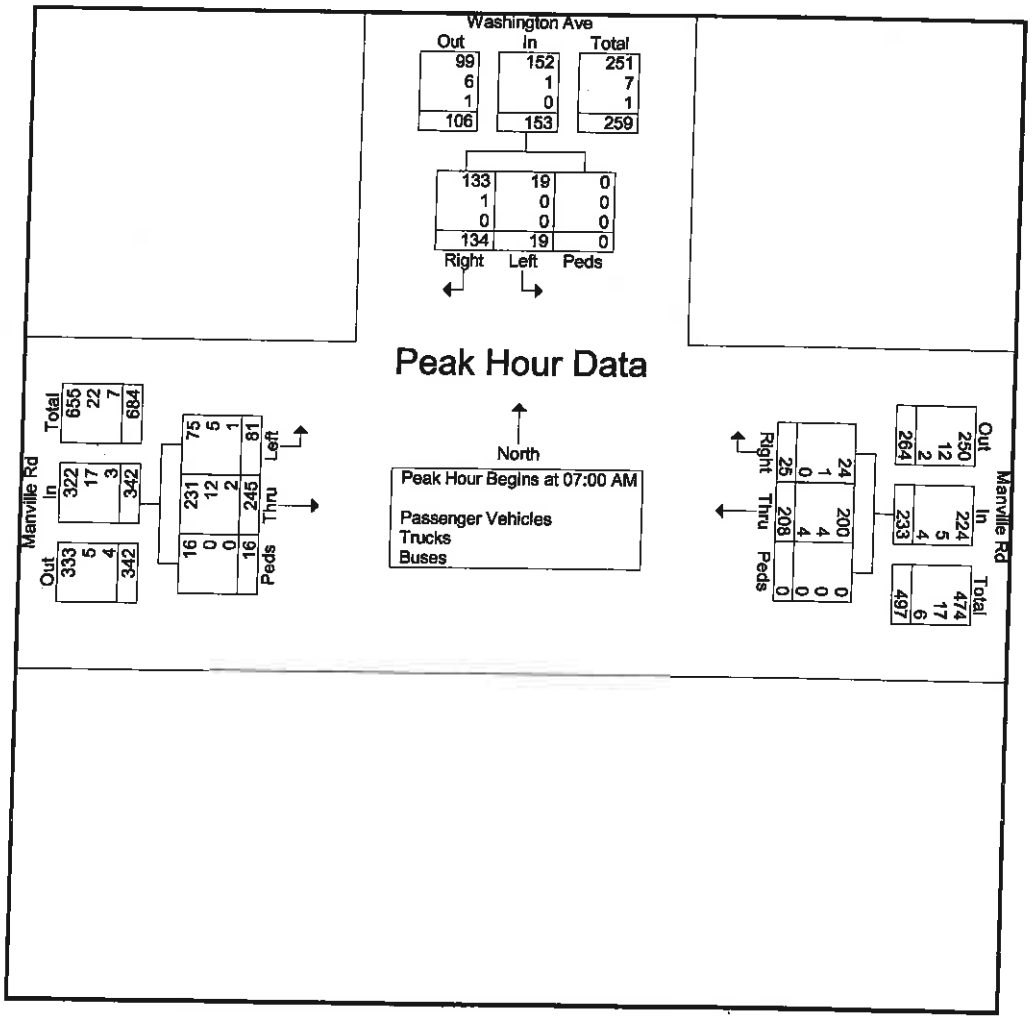
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Washington
November 1, 2017
6:00 - 8:00 PM

File Name : Manville_Washington AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Washington Ave From North				Manville Rd From East				Manville Rd From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	4	29	0	33	38	3	0	41	11	29	2	42	116
07:15 AM	4	**41**	0	**45**	52	8	0	60	12	38	4	54	159
07:30 AM	2	35	0	37	54	5	0	59	23	83	4	110	206
07:45 AM	**9**	29	0	38	**64**	**9**	0	**73**	**35**	**95**	**6**	**136**	**247**
Total Volume	19	134	0	153	208	25	0	233	81	245	16	342	728
% App. Total	12.4	87.6	0		89.3	10.7	0		23.7	71.6	4.7		
PHF	.528	.817	.000	.850	.813	.694	.000	.798	.579	.645	.667	.629	.737
Passenger Vehicles	19	133	0	152	200	24	0	224	75	231	16	322	698
% Passenger Vehicles	100	99.3	0	99.3	96.2	96.0	0	96.1	92.6	94.3	100	94.2	95.9
Trucks	0	1	0	1	4	1	0	5	5	12	0	17	23
% Trucks	0	0.7	0	0.7	1.9	4.0	0	2.1	6.2	4.9	0	5.0	3.2
Buses	0	0	0	0	4	0	0	4	1	2	0	3	7
% Buses	0	0	0	0	1.9	0	0	1.7	1.2	0.8	0	0.9	1.0



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Washington
November 1, 2017
3:00 - 6:00 PM

File Name : Manville_Washington PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Washington Ave From North				Manville Rd From East				Manville Rd From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
03:00 PM	6	46	0	52	82	8	0	90	22	46	4	72	214
03:15 PM	6	41	0	47	109	9	0	118	26	58	5	89	254
03:30 PM	12	45	0	57	76	12	0	88	42	41	5	88	233
03:45 PM	9	41	0	50	77	9	1	87	30	54	6	90	227
Total	33	173	0	206	344	38	1	383	120	199	20	339	928
04:00 PM	11	50	0	61	58	16	0	74	39	34	7	80	215
04:15 PM	6	44	0	50	87	11	0	98	38	49	7	94	242
04:30 PM	9	40	0	49	57	8	0	65	28	44	6	78	192
04:45 PM	7	55	0	62	85	12	0	97	35	74	8	117	276
Total	33	189	0	222	287	47	0	334	140	201	28	369	925
05:00 PM	7	36	0	43	75	6	0	81	44	40	8	92	216
05:15 PM	7	34	0	41	81	7	0	88	37	64	5	106	235
05:30 PM	4	33	0	37	73	5	0	78	36	55	8	99	214
05:45 PM	7	37	0	44	71	5	0	76	29	39	6	74	194
Total	25	140	0	165	300	23	0	323	146	198	27	371	859
Grand Total	91	502	0	593	931	108	1	1040	406	598	75	1079	2712
Apprch %	15.3	84.7	0		89.5	10.4	0.1		37.6	55.4	7		
Total %	3.4	18.5	0	21.9	34.3	4	0	38.3	15	22.1	2.8	39.8	
Passenger Vehicles	89	489	0	578	903	108	1	1012	401	567	75	1043	2633
% Passenger Vehicles	97.8	97.4	0	97.5	97	100	100	97.3	98.8	94.8	100	96.7	97.1
Trucks	2	13	0	15	18	0	0	18	5	22	0	27	60
% Trucks	2.2	2.6	0	2.5	1.9	0	0	1.7	1.2	3.7	0	2.5	2.2
Buses	0	0	0	0	10	0	0	10	0	9	0	9	19
% Buses	0	0	0	0	1.1	0	0	1	0	1.5	0	0.8	0.7

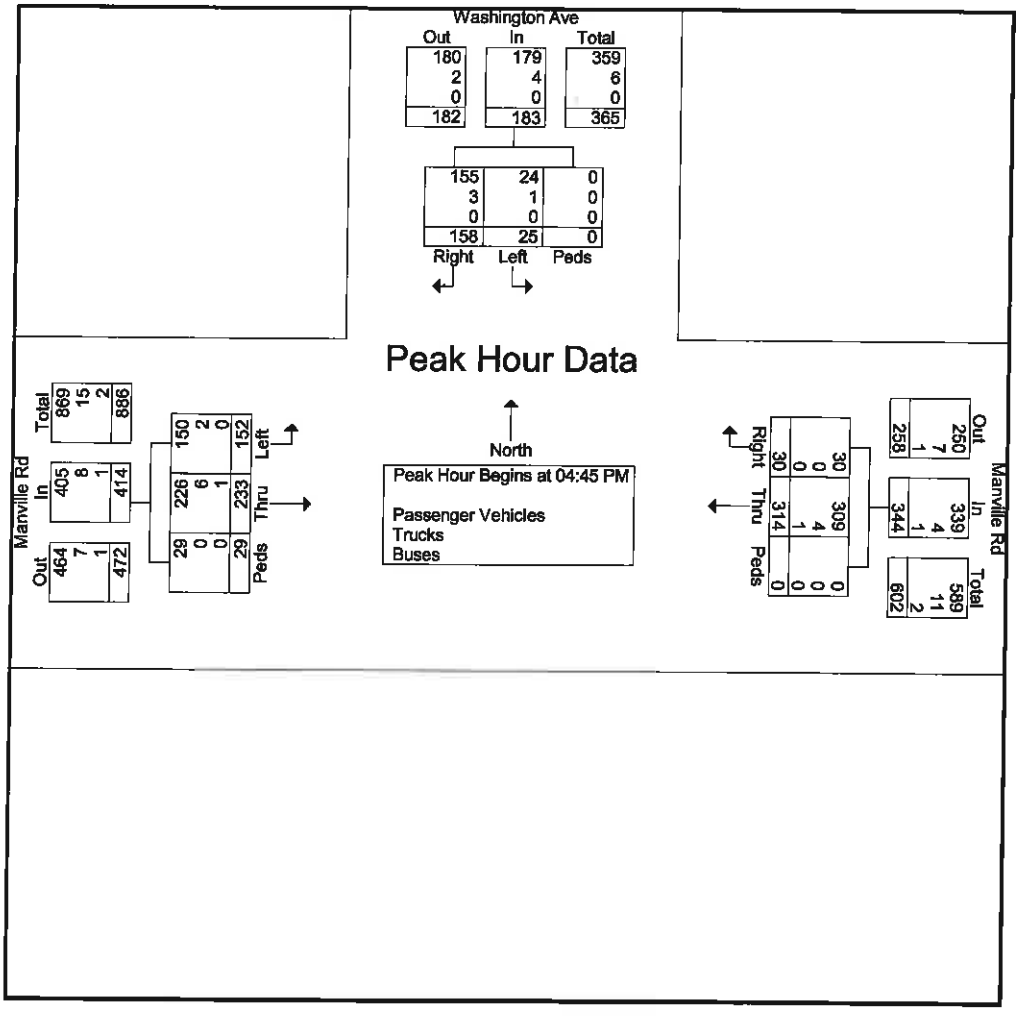
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Washington
November 1, 2017
3:00 - 6:00 PM

File Name : Manville_Washington PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Washington Ave From North				Manville Rd From East				Manville Rd From West				
Start Time	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	7	55	0	62	85	12	0	97	35	74	8	117	276
05:00 PM	7	36	0	43	75	6	0	81	44	40	8	92	216
05:15 PM	7	34	0	41	81	7	0	88	37	64	5	106	235
05:30 PM	4	33	0	37	73	5	0	78	36	55	8	99	214
Total Volume	25	158	0	183	314	30	0	344	152	233	29	414	941
% App. Total	13.7	86.3	0		91.3	8.7	0		36.7	56.3	7		
PHF	.893	.718	.000	.738	.924	.625	.000	.887	.864	.787	.906	.885	.852
Passenger Vehicles	24	155	0	179	309	30	0	339	150	226	29	405	923
% Passenger Vehicles	96.0	98.1	0	97.8	98.4	100	0	98.5	98.7	97.0	100	97.8	98.1
Trucks	1	3	0	4	4	0	0	4	2	6	0	8	16
% Trucks	4.0	1.9	0	2.2	1.3	0	0	1.2	1.3	2.6	0	1.9	1.7
Buses	0	0	0	0	1	0	0	1	0	1	0	1	2
% Buses	0	0	0	0	0.3	0	0	0.3	0	0.4	0	0.2	0.2



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Tompkins
November 1, 2017
6:00 - 8:00 AM

File Name : Manville_Tompkins AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Manville Rd From East				Tompkins Ave From South				Manville Rd From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	14	0	14	0	0	7	7	3	1	0	4	25
06:15 AM	0	14	0	14	4	1	4	9	5	1	1	7	30
06:30 AM	2	23	0	25	5	1	2	8	14	0	4	18	51
06:45 AM	11	28	0	39	4	1	10	15	22	2	5	29	83
Total	13	79	0	92	13	3	23	39	44	4	10	58	189
07:00 AM	4	33	0	37	4	0	3	7	24	5	1	30	74
07:15 AM	2	40	0	42	9	7	14	30	28	2	1	31	103
07:30 AM	3	45	0	48	16	15	9	40	61	6	3	70	158
07:45 AM	11	57	0	68	17	9	10	36	89	18	1	108	212
Total	20	175	0	195	46	31	36	113	202	31	6	239	547
Grand Total	33	254	0	287	59	34	59	152	246	35	16	297	736
Apprch %	11.5	88.5	0		38.8	22.4	38.8		82.8	11.8	5.4		
Total %	4.5	34.5	0	39	8	4.6	8	20.7	33.4	4.8	2.2	40.4	
Passenger Vehicles	32	243	0	275	59	33	59	151	223	35	16	274	700
% Passenger Vehicles	97	95.7	0	95.8	100	97.1	100	99.3	90.7	100	100	92.3	95.1
Trucks	1	7	0	8	0	1	0	1	20	0	0	20	29
% Trucks	3	2.8	0	2.8	0	2.9	0	0.7	8.1	0	0	6.7	3.9
Buses	0	4	0	4	0	0	0	0	3	0	0	3	7
% Buses	0	1.6	0	1.4	0	0	0	0	1.2	0	0	1	1

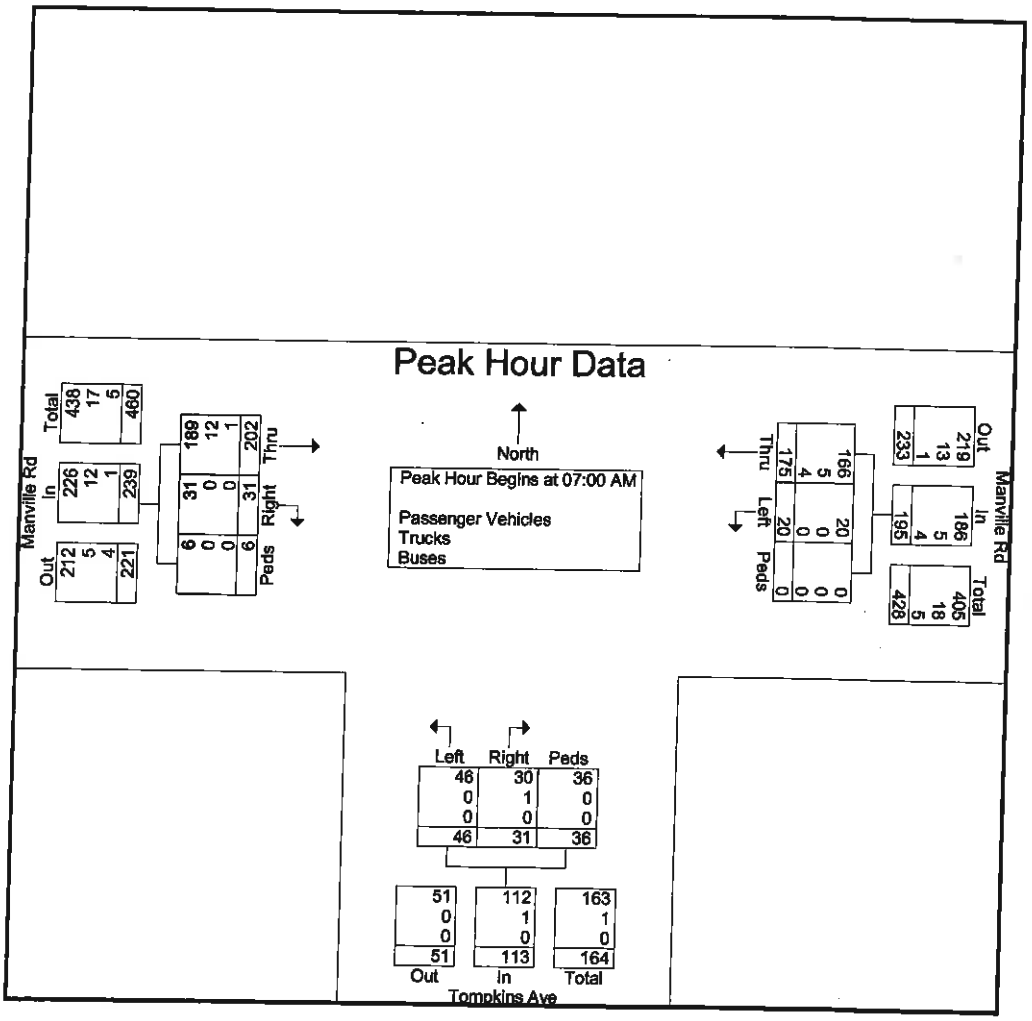
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Tompkins
November 1, 2017
6:00 - 8:00 AM

File Name : Manville_Tompkins AM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Manville Rd From East				Tompkins Ave From South				Manville Rd From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 07:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	4	33	0	37	4	0	3	7	24	5	1	30	74
07:15 AM	2	40	0	42	9	7	**14**	30	28	2	1	31	103
07:30 AM	3	45	0	48	16	**15**	9	**40**	61	6	**3**	70	158
07:45 AM	**11**	**57**	0	**68**	**17**	9	10	36	**89**	**18**	1	**108**	**212**
Total Volume	20	175	0	195	46	31	36	113	202	31	6	239	547
% App. Total	10.3	89.7	0		40.7	27.4	31.9		84.5	13	2.5		
PHF	.455	.768	.000	.717	.676	.517	.643	.706	.567	.431	.500	.553	.645
Passenger Vehicles	20	166	0	186	46	30	36	112	189	31	6	226	524
% Passenger Vehicles	100	94.9	0	95.4	100	96.8	100	99.1	93.6	100	100	94.6	95.8
Trucks	0	5	0	5	0	1	0	1	12	0	0	12	18
% Trucks	0	2.9	0	2.6	0	3.2	0	0.9	5.9	0	0	5.0	3.3
Buses	0	4	0	4	0	0	0	0	1	0	0	1	5
% Buses	0	2.3	0	2.1	0	0	0	0	0.5	0	0	0.4	0.9



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Tompkins
November 1, 2017
3:00 - 6:00 PM

File Name : Manville_Tompkins PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 1

Groups Printed- Passenger Vehicles - Trucks - Buses

	Manville Rd From East				Tompkins Ave From South				Manville Rd From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	16	90	0	106	14	13	18	45	50	10	8	68	219
03:15 PM	8	76	0	84	18	8	13	39	43	8	9	60	183
03:30 PM	8	70	0	78	21	6	5	32	50	6	2	58	168
03:45 PM	8	73	0	81	15	7	6	28	55	6	3	64	173
Total	40	309	0	349	68	34	42	144	198	30	22	250	743
04:00 PM	4	72	0	76	18	7	5	30	41	7	16	64	170
04:15 PM	5	65	0	70	15	12	8	35	49	5	3	57	162
04:30 PM	10	61	0	71	12	9	2	23	44	8	7	59	153
04:45 PM	2	71	0	73	21	12	6	39	58	11	3	72	184
Total	21	269	0	290	66	40	21	127	192	31	29	252	669
05:00 PM	2	59	0	61	26	9	2	37	38	8	1	47	145
05:15 PM	3	73	0	76	18	2	5	25	62	7	5	74	175
05:30 PM	5	62	0	67	10	6	2	18	51	6	10	67	152
05:45 PM	1	60	0	61	15	7	16	38	48	9	3	60	159
Total	11	254	0	265	69	24	25	118	199	30	19	248	631
Grand Total	72	832	0	904	203	98	88	389	589	91	70	750	2043
Apprch %	8	92	0		52.2	25.2	22.6		78.5	12.1	9.3		
Total %	3.5	40.7	0	44.2	9.9	4.8	4.3	19	28.8	4.5	3.4	36.7	
Passenger Vehicles	71	803	0	874	202	97	88	387	560	91	70	721	1982
% Passenger Vehicles	98.6	96.5	0	96.7	99.5	99	100	99.5	95.1	100	100	96.1	97
Trucks	1	19	0	20	1	1	0	2	20	0	0	20	42
% Trucks	1.4	2.3	0	2.2	0.5	1	0	0.5	3.4	0	0	2.7	2.1
Buses	0	10	0	10	0	0	0	0	9	0	0	9	19
% Buses	0	1.2	0	1.1	0	0	0	0	1.5	0	0	1.2	0.9

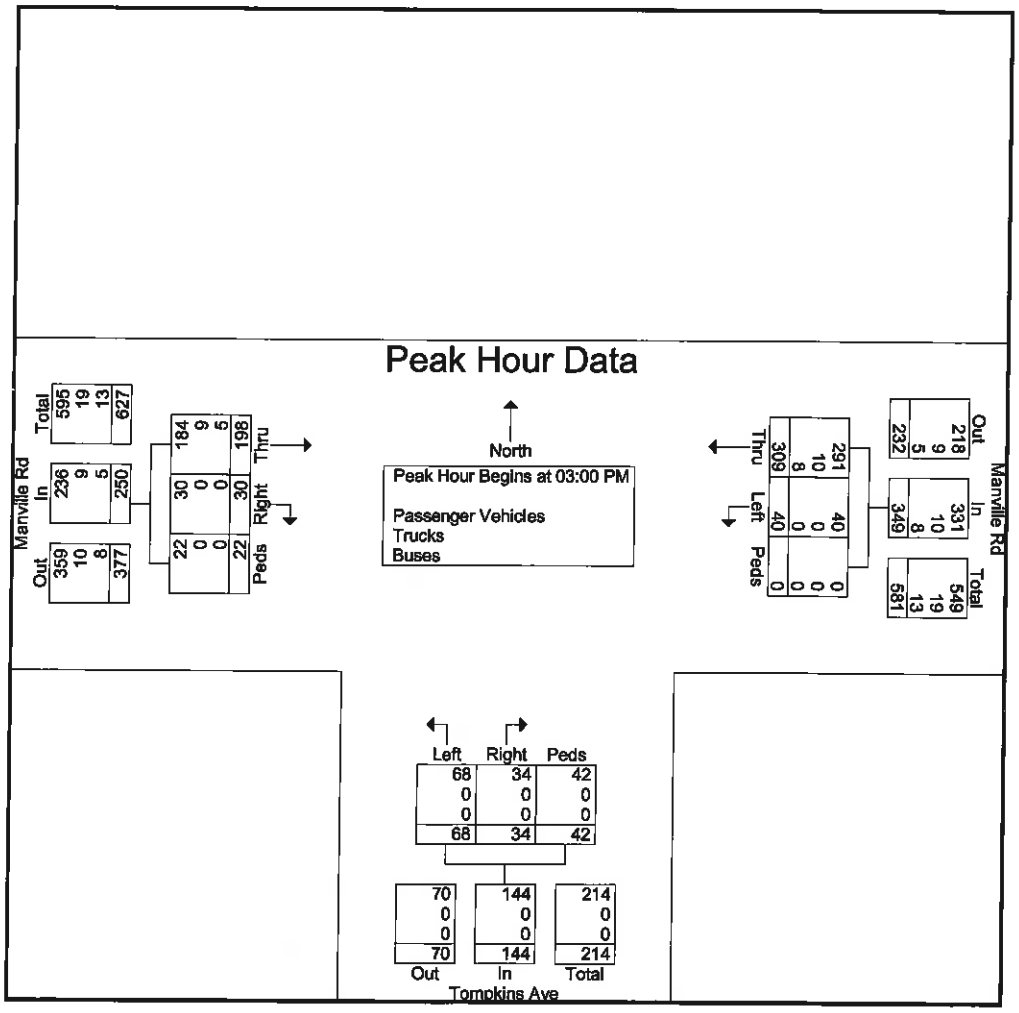
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Manville at Tompkins
November 1, 2017
3:00 - 6:00 PM

File Name : Manville_Tompkins PM
Site Code : 17-308
Start Date : 11/1/2017
Page No : 2

	Manville Rd From East				Tompkins Ave From South				Manville Rd From West				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	**16**	**90**	0	**106**	14	**13**	**18**	**45**	50	**10**	8	**68**	**219**
03:15 PM	8	76	0	84	18	8	13	39	43	8	**9**	60	183
03:30 PM	8	70	0	78	**21**	6	5	32	50	6	2	58	168
03:45 PM	8	73	0	81	15	7	6	28	**55**	6	3	64	173
Total Volume	40	309	0	349	68	34	42	144	198	30	22	250	743
% App. Total	11.5	88.5	0		47.2	23.6	29.2		79.2	12	8.8		
PHF	.625	.858	.000	.823	.810	.654	.583	.800	.900	.750	.611	.919	.848
Passenger Vehicles	40	291	0	331	68	34	42	144	184	30	22	236	711
% Passenger Vehicles	100	94.2	0	94.8	100	100	100	100	92.9	100	100	94.4	95.7
Trucks	0	10	0	10	0	0	0	0	9	0	0	9	19
% Trucks	0	3.2	0	2.9	0	0	0	0	4.5	0	0	3.6	2.6
Buses	0	8	0	8	0	0	0	0	5	0	0	5	13
% Buses	0	2.6	0	2.3	0	0	0	0	2.5	0	0	2.0	1.7



HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Grant Street at SMRP
April 12, 2018
2:45 - 6:30 PM

File Name : Grant_SMRP_PM
Site Code : 17-308
Start Date : 4/12/2018
Page No : 1

Groups Printed- All Vehicles

	Grant Street From North					Saw Mill River Parkway From East					Grant Street From South					Saw Mill River Parkway From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:45 PM	6	5	1	0	12	0	303	0	2	305	23	8	63	0	94	0	378	11	0	389	800
Total	6	5	1	0	12	0	303	0	2	305	23	8	63	0	94	0	378	11	0	389	800
03:00 PM	11	5	1	0	17	0	321	0	0	321	17	13	48	0	78	0	415	13	0	428	844
03:15 PM	4	6	3	0	13	0	373	0	1	374	17	10	57	0	84	0	467	14	0	481	952
03:30 PM	8	8	1	0	17	0	382	0	3	385	15	5	75	0	95	0	485	18	0	503	1000
03:45 PM	13	6	2	0	21	0	341	0	3	344	27	7	52	0	86	0	382	9	0	391	842
Total	36	25	7	0	68	0	1417	0	7	1424	76	35	232	0	343	0	1749	54	0	1803	3638
04:00 PM	8	7	1	0	16	0	358	0	2	360	15	9	66	0	90	0	484	15	0	499	965
04:15 PM	13	6	4	0	23	0	393	0	3	396	19	9	54	0	82	0	422	19	0	441	942
04:30 PM	6	8	2	0	16	0	398	0	2	400	16	13	61	0	90	0	464	10	0	474	980
04:45 PM	11	9	0	0	20	0	398	0	2	400	22	8	78	0	108	0	432	12	0	444	972
Total	38	30	7	0	75	0	1547	0	9	1556	72	39	259	0	370	0	1802	56	0	1858	3859
05:00 PM	13	10	1	0	24	0	449	0	4	453	26	7	77	0	110	0	465	17	0	482	1069
05:15 PM	21	10	5	0	36	0	423	0	2	425	23	7	84	0	114	0	471	16	0	487	1062
05:30 PM	6	9	3	0	18	0	359	0	1	360	25	11	76	0	112	0	432	14	0	446	936
05:45 PM	9	10	1	0	20	0	346	0	3	349	24	4	69	0	97	0	438	15	0	453	919
Total	49	39	10	0	98	0	1577	0	10	1587	98	29	306	0	433	0	1806	62	0	1868	3986
06:00 PM	5	8	1	0	14	0	313	0	2	315	25	18	62	0	105	0	377	18	0	395	829
06:15 PM	5	5	1	0	11	0	284	0	2	286	16	6	38	0	60	0	384	13	0	397	754
06:30 PM	10	8	4	0	22	0	250	0	1	251	0	0	0	0	0	0	0	0	0	0	273
Grand Total	149	120	31	0	300	0	5691	0	33	5724	310	135	960	0	1405	0	6496	214	0	6710	14139
Approch %	49.7	40	10.3	0		0	99.4	0	0.6		22.1	9.6	68.3	0		0	96.8	3.2	0		
Total %	1.1	0.8	0.2	0	2.1	0	40.3	0	0.2	40.5	2.2	1	6.8	0	9.9	0	45.9	1.5	0	47.5	

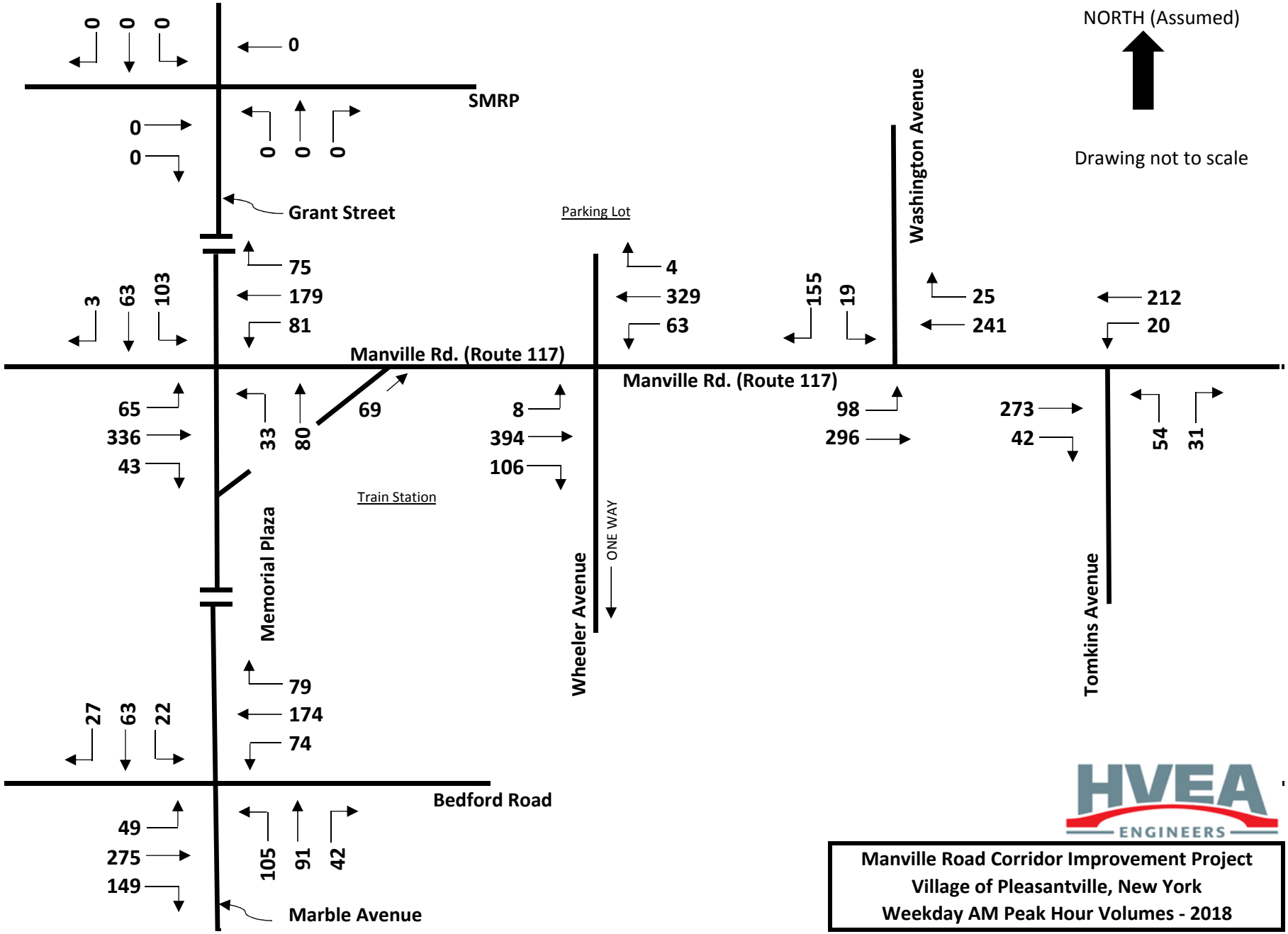
HVEA Engineers, PC

560 Route 52, Suite 201
Beacon, NY 12508

Manville Road Corridor Improvements
Grant Street at SMRP
April 12, 2018
2:45 - 6:30 PM

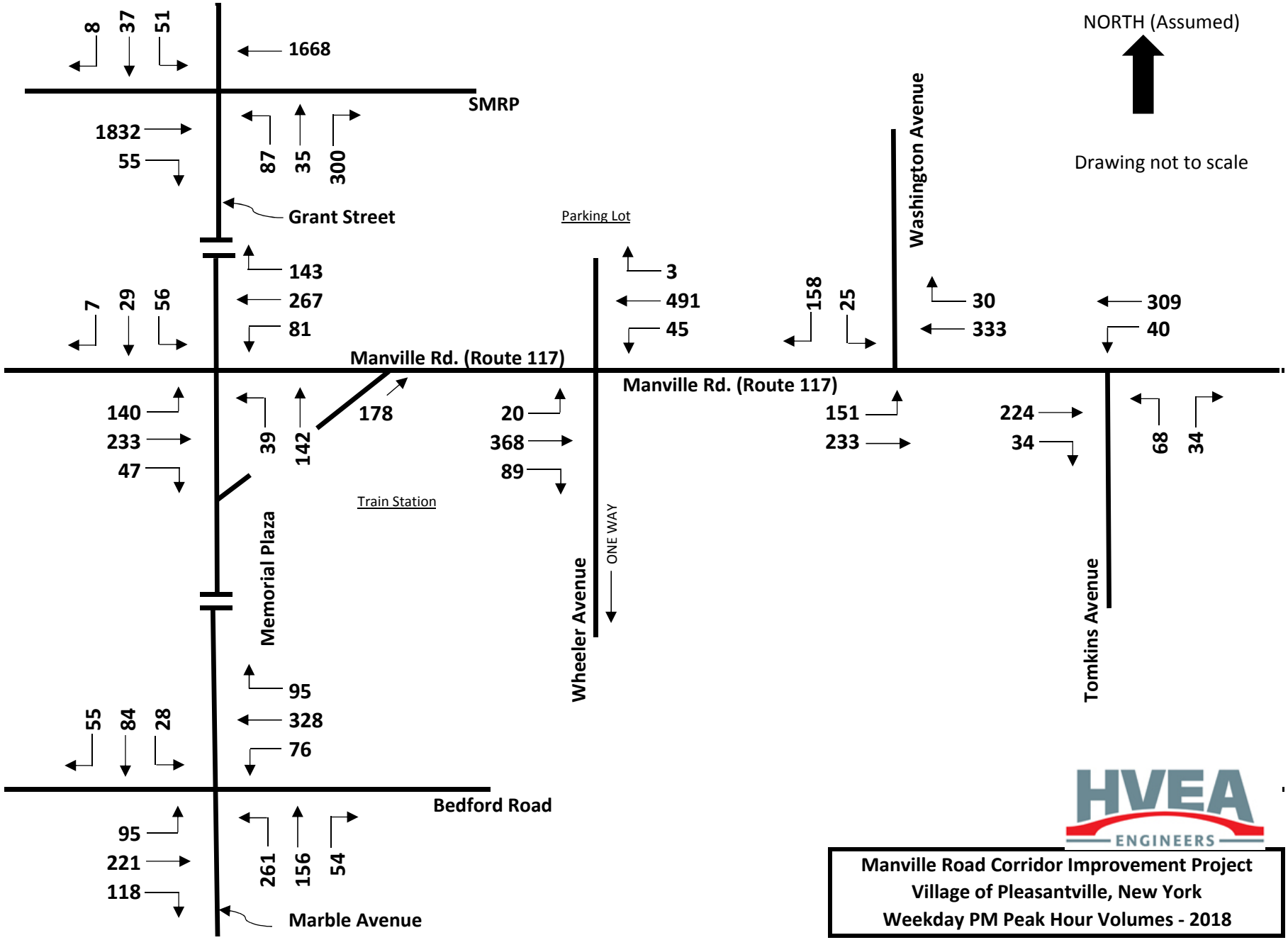
File Name : Grant_SMRP_PM
Site Code : 17-308
Start Date : 4/12/2018
Page No : 3

	Grant Street From North					Saw Mill River Parkway From East					Grant Street From South					Saw Mill River Parkway From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:45 PM to 06:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	6	8	2	0	16	0	398	0	2	400	16	**13**	61	0	90	0	464	10	0	474	980
04:45 PM	11	9	0	0	20	0	398	0	2	400	22	8	78	0	108	0	432	12	0	444	972
05:00 PM	13	**10**	1	0	24	0	**449**	0	**4**	**453**	**26**	7	77	0	110	0	465	**17**	0	482	**1069**
05:15 PM	**21**	10	**5**	0	**36**	0	423	0	2	425	23	7	**84**	0	**114**	0	**471**	16	0	**487**	1062
Total Volume	51	37	8	0	96	0	1668	0	10	1678	87	35	300	0	422	0	1832	55	0	1887	4083
% App. Total	53.1	38.5	8.3	0		0	99.4	0	0.6		20.6	8.3	71.1	0		0	97.1	2.9	0		
PHF	.607	.925	.400	.000	.667	.000	.929	.000	.625	.926	.837	.673	.893	.000	.925	.000	.972	.809	.000	.969	.955



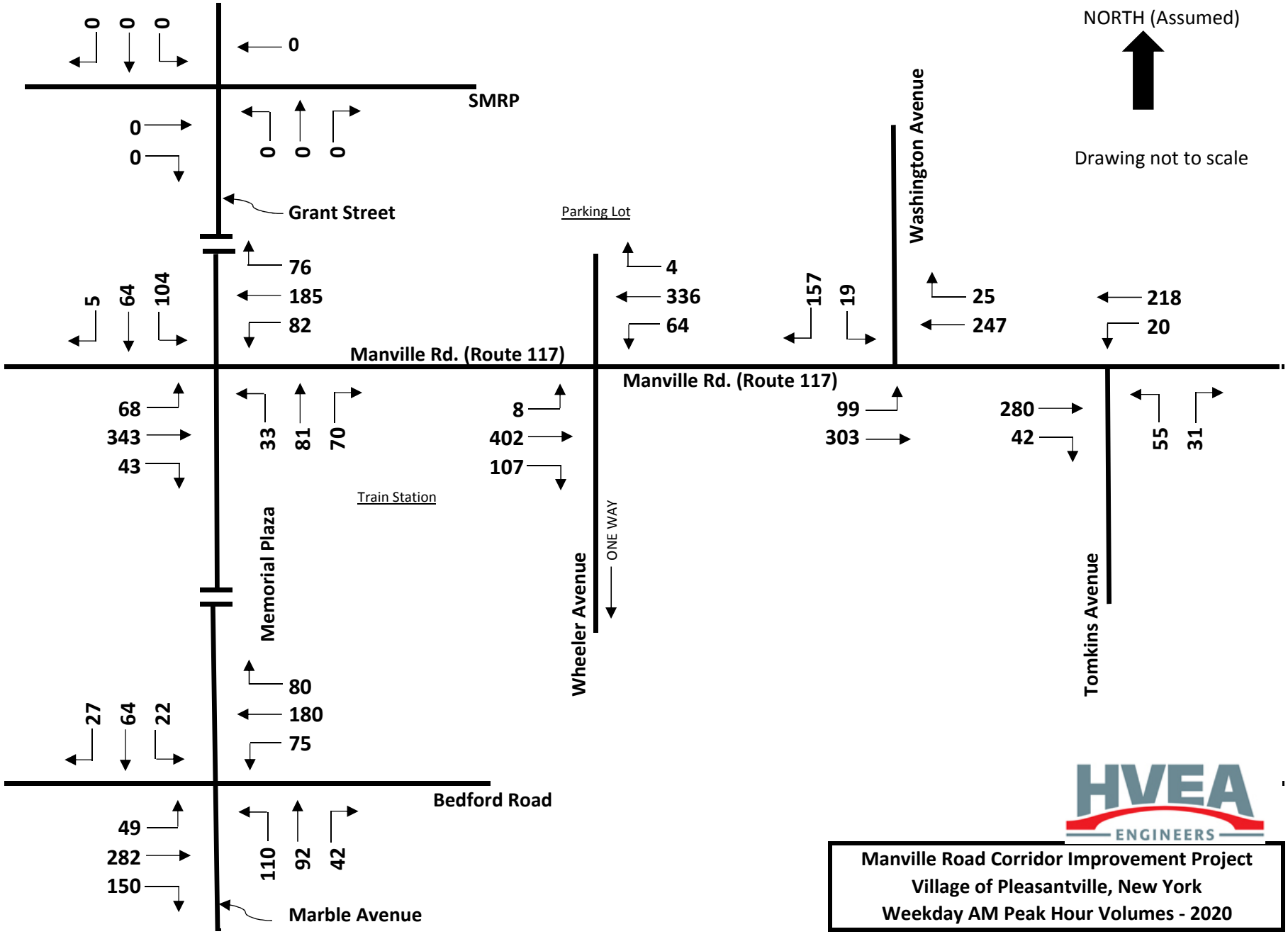
HVEA ENGINEERS

Manville Road Corridor Improvement Project
Village of Pleasantville, New York
Weekday AM Peak Hour Volumes - 2018



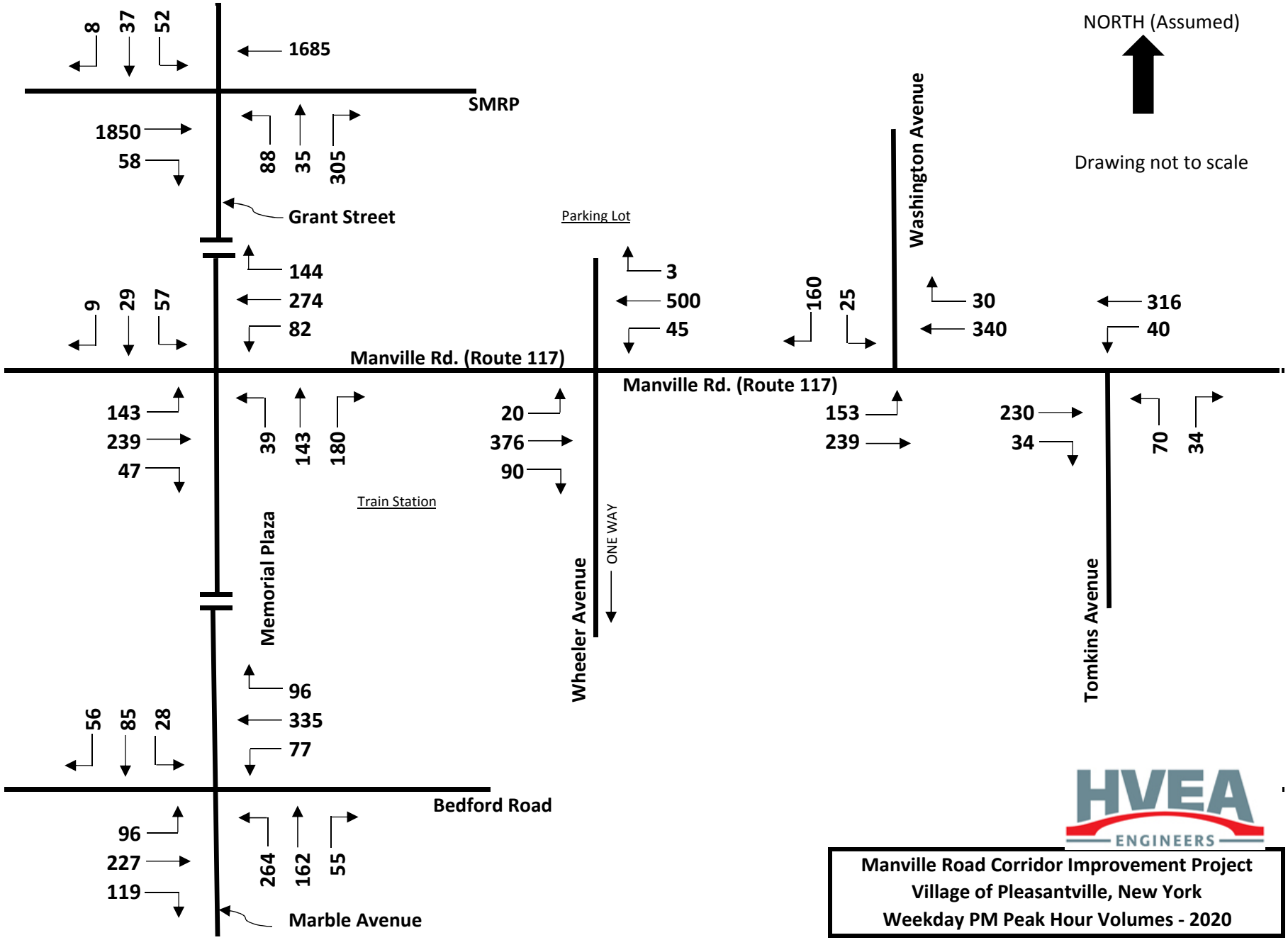
HVEA ENGINEERS

Manville Road Corridor Improvement Project
Village of Pleasantville, New York
Weekday PM Peak Hour Volumes - 2018



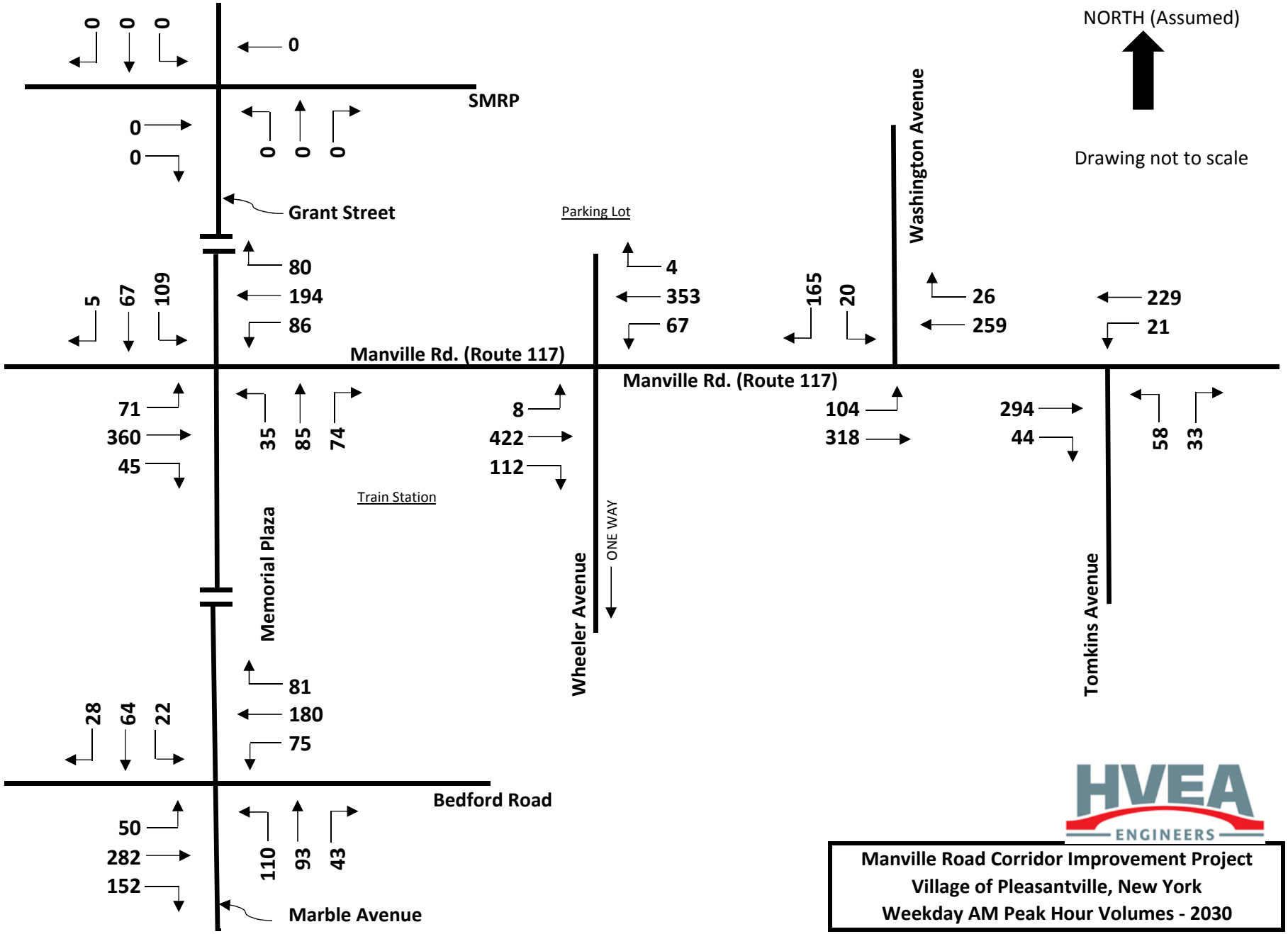
HVEA ENGINEERS

Manville Road Corridor Improvement Project
Village of Pleasantville, New York
Weekday AM Peak Hour Volumes - 2020



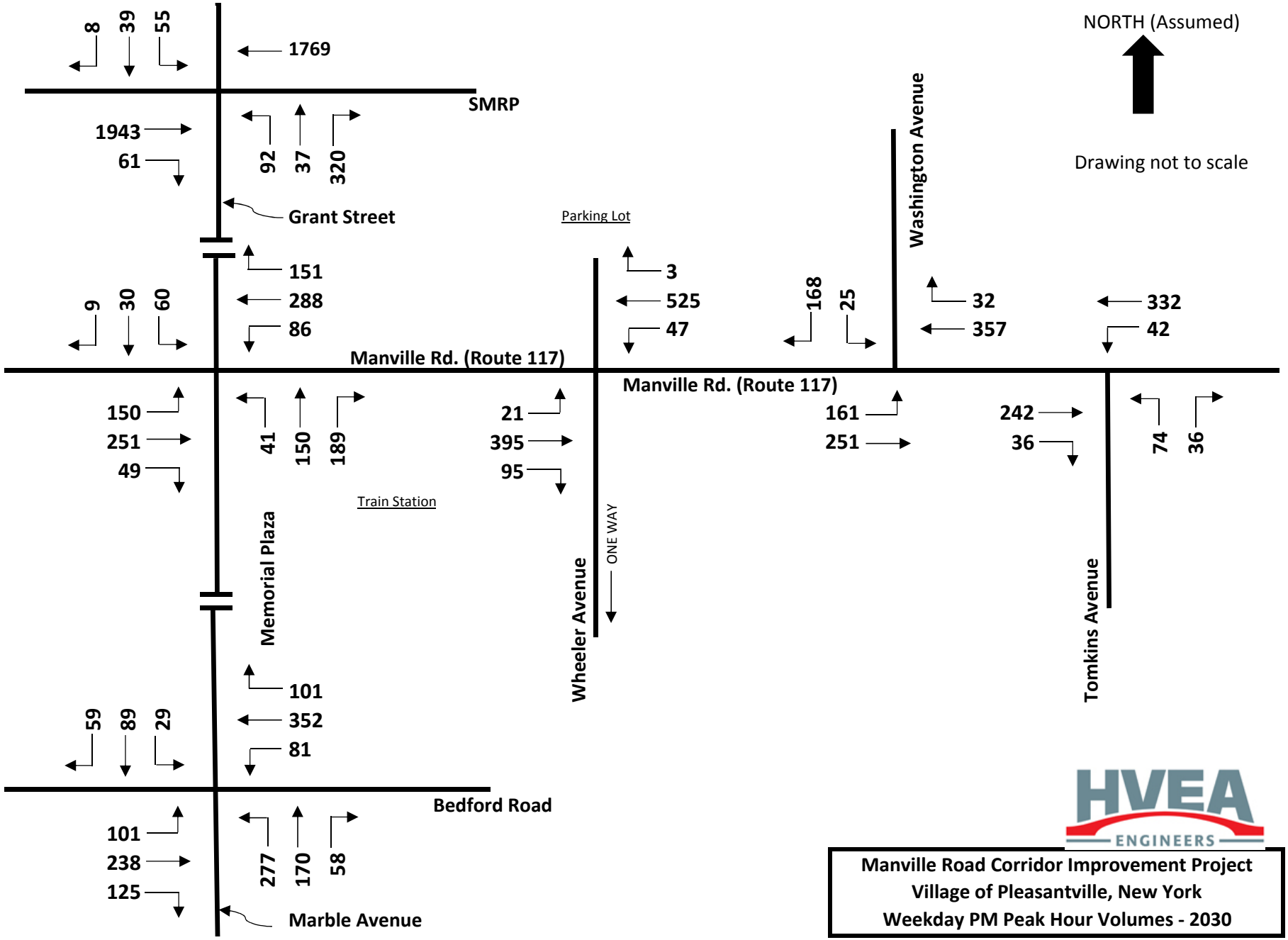
HVEA ENGINEERS

Manville Road Corridor Improvement Project
Village of Pleasantville, New York
Weekday PM Peak Hour Volumes - 2020



HVEA ENGINEERS

Manville Road Corridor Improvement Project
Village of Pleasantville, New York
Weekday AM Peak Hour Volumes - 2030



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Manville Road Corridor Improvement Project
Village of Pleasantville, New York
Weekday PM Peak Hour Volumes - 2030

APPENDIX B

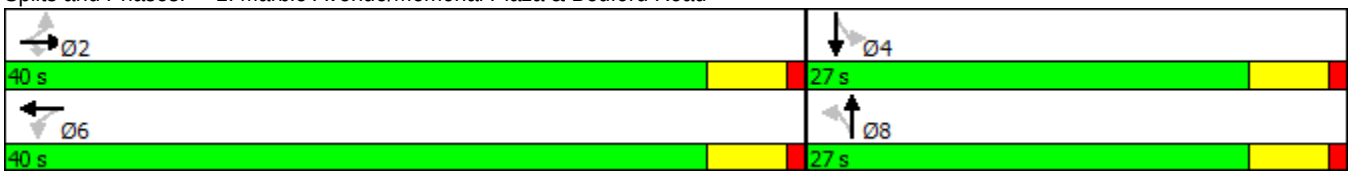
SYNCHRO ANALYSIS WORKSHEETS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	275	149	74	174	79	105	91	42	22	63	27
Future Volume (vph)	49	275	149	74	174	79	105	91	42	22	63	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.953			0.953			0.967	
Flt Protected		0.992		0.950			0.950				0.990	
Satd. Flow (prot)	0	1663	1425	1593	1598	0	1593	1598	0	0	1605	0
Flt Permitted		0.911		0.502			0.811				0.900	
Satd. Flow (perm)	0	1527	1425	842	1598	0	1360	1598	0	0	1459	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			191		51			37			26	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		94			294			220			454	
Travel Time (s)		2.1			6.7			5.0			10.3	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	63	353	191	95	223	101	135	117	54	28	81	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	416	191	95	324	0	135	171	0	0	144	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		27.0	27.0		27.0	27.0	
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%		40.3%	40.3%		40.3%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)		25.4	25.4	25.4	25.4		11.2	11.2			11.0	
Actuated g/C Ratio		0.60	0.60	0.60	0.60		0.26	0.26			0.26	
v/c Ratio		0.45	0.20	0.19	0.33		0.38	0.38			0.36	
Control Delay		10.0	2.2	8.5	7.4		17.2	13.8			14.5	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		10.0	2.2	8.5	7.4		17.2	13.8			14.5	
LOS		B	A	A	A		B	B			B	
Approach Delay		7.6			7.7			15.3			14.5	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		54	0	10	31		25	24			21	
Queue Length 95th (ft)		142	18	38	89		65	65			59	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		14			214			140			374	
Turn Bay Length (ft)							300					
Base Capacity (vph)		1273	1219	702	1340		765	915			832	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	
Reduced v/c Ratio		0.33	0.16	0.14	0.24		0.18	0.19			0.17	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 67			
Actuated Cycle Length: 42.3			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 67.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Marble Avenue/Memorial Plaza & Bedford Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	336	43	81	179	75	33	80	0	103	63	3
Future Volume (vph)	65	336	43	81	179	75	33	80	0	103	63	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.970						0.998	
Flt Protected		0.993			0.988			0.986			0.970	
Satd. Flow (prot)	0	1607	0	0	1607	0	0	1653	0	0	1623	0
Flt Permitted		0.900			0.806			0.885			0.787	
Satd. Flow (perm)	0	1457	0	0	1311	0	0	1484	0	0	1317	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			30						1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			174			153			410	
Travel Time (s)		4.2			4.0			3.5			9.3	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	73	378	48	91	201	84	37	90	0	116	71	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	499	0	0	376	0	0	127	0	0	190	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		27.0	27.0		27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	53.8%	53.8%		53.8%	53.8%		46.2%	46.2%		46.2%	46.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		32.9			32.9			13.8			13.8	
Actuated g/C Ratio		0.58			0.58			0.24			0.24	
v/c Ratio		0.59			0.49			0.35			0.59	
Control Delay		12.6			10.5			18.9			25.6	
Queue Delay		0.0			0.3			0.0			0.0	
Total Delay		12.6			10.8			18.9			25.6	
LOS		B			B			B			C	
Approach Delay		12.6			10.8			18.9			25.6	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)		86			55			33			52	
Queue Length 95th (ft)		235			160			67			101	
Internal Link Dist (ft)		105			94			73			330	
Turn Bay Length (ft)												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		848			772			657			584	
Starvation Cap Reductn		0			84			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.59			0.55			0.19			0.33	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 65			
Actuated Cycle Length: 56.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 58.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Memorial Plaza/Grant Street & Manville Road

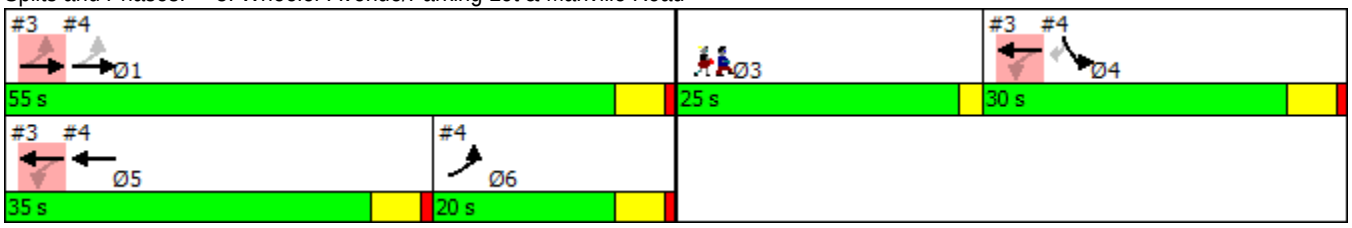
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	394	106	63	329	4	0	0	0	0	0	0
Future Volume (vph)	8	394	106	63	329	4	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	16	16	12	12	12	12	12	12	12
Storage Length (ft)	80		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.999							
Flt Protected	0.950				0.992							
Satd. Flow (prot)	1593	1784	0	0	1883	0	0	0	0	0	0	0
Flt Permitted	0.161				0.825							
Satd. Flow (perm)	270	1784	0	0	1566	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			1							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		151			119			129			120	
Travel Time (s)		3.4			2.7			2.9			2.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	2%	6%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	10	512	138	82	427	5	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	650	0	0	514	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA							
Protected Phases		1			5 4							
Permitted Phases	1			5 4								
Detector Phase	1	1		5 4	5 4							
Switch Phase												
Minimum Initial (s)	5.0	5.0										
Minimum Split (s)	55.0	55.0										
Total Split (s)	55.0	55.0										
Total Split (%)	50.0%	50.0%										
Yellow Time (s)	4.0	4.0										
All-Red Time (s)	1.0	1.0										
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	5.0	5.0										
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max										
Act Effct Green (s)	51.9	51.9			55.5							
Actuated g/C Ratio	0.58	0.58			0.62							
v/c Ratio	0.06	0.63			0.53							
Control Delay	17.8	20.8			7.7							
Queue Delay	0.0	23.0			0.8							
Total Delay	17.8	43.8			8.5							
LOS	B	D			A							
Approach Delay		43.4			8.5							
Approach LOS		D			A							

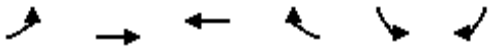
Lane Group	Ø3	Ø4	Ø5	Ø6
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Storage Length (ft)				
Storage Lanes				
Taper Length (ft)				
Lane Util. Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	5	6
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	2.0	2.0	2.0
Minimum Split (s)	25.0	9.0	9.0	9.0
Total Split (s)	25.0	30.0	35.0	20.0
Total Split (%)	23%	27%	32%	18%
Yellow Time (s)	2.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	2	157			38							
Queue Length 95th (ft)	13	420			78							
Internal Link Dist (ft)		71			39			49			40	
Turn Bay Length (ft)	80											
Base Capacity (vph)	155	1033			964							
Starvation Cap Reductn	0	394			195							
Spillback Cap Reductn	0	2			0							
Storage Cap Reductn	0	0			0							
Reduced v/c Ratio	0.06	1.02			0.67							

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 90.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 61.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Wheeler Avenue/Parking Lot & Manville Road



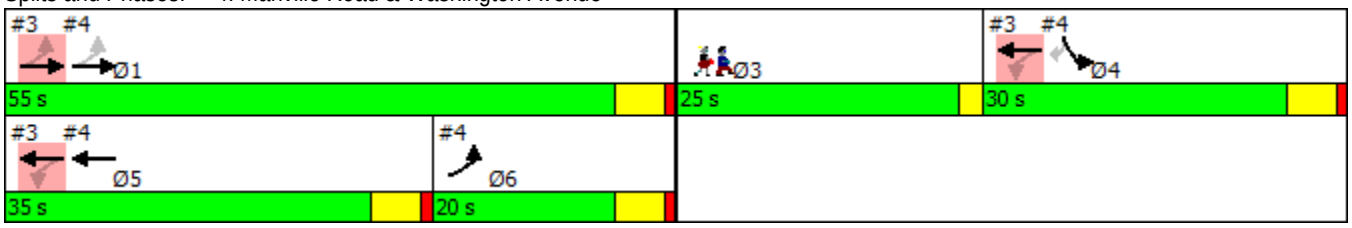


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	98	296	241	25	19	155	
Future Volume (vph)	98	296	241	25	19	155	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	
Storage Length (ft)	65			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
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)	1518	1828	1623	0	1593	1425	
Flt Permitted	0.395				0.950		
Satd. Flow (perm)	631	1828	1623	0	1593	1425	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			5			209	
Link Speed (mph)		30	30		30		
Link Distance (ft)		119	231		149		
Travel Time (s)		2.7	5.3		3.4		
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	
Heavy Vehicles (%)	7%	6%	4%	4%	2%	2%	
Adj. Flow (vph)	132	400	326	34	26	209	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	132	400	360	0	26	209	
Turn Type	pm+pt	NA	NA		Prot	Perm	
Protected Phases	6	1	5		4		3
Permitted Phases	1					4	
Detector Phase	6	1	5		4	4	
Switch Phase							
Minimum Initial (s)	2.0	5.0	2.0		2.0	2.0	1.0
Minimum Split (s)	9.0	55.0	9.0		9.0	9.0	25.0
Total Split (s)	20.0	55.0	35.0		30.0	30.0	25.0
Total Split (%)	18.2%	50.0%	31.8%		27.3%	27.3%	23%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lag		Lead		Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	None	Max	Max		None	None	None
Act Effct Green (s)	51.9	51.9	31.2		19.2	19.2	
Actuated g/C Ratio	0.58	0.58	0.35		0.21	0.21	
v/c Ratio	0.26	0.38	0.64		0.08	0.45	
Control Delay	3.4	3.1	35.2		32.5	8.4	
Queue Delay	2.5	1.1	0.2		0.0	0.2	
Total Delay	5.9	4.2	35.4		32.5	8.6	
LOS	A	A	D		C	A	
Approach Delay		4.6	35.4		11.3		
Approach LOS		A	D		B		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Queue Length 50th (ft)	4	11	135		10	0	
Queue Length 95th (ft)	11	27	274		32	27	
Internal Link Dist (ft)		39	151		69		
Turn Bay Length (ft)	65						
Base Capacity (vph)	516	1052	563		458	558	
Starvation Cap Reductn	279	413	0		0	0	
Spillback Cap Reductn	0	0	15		0	57	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.56	0.63	0.66		0.06	0.42	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 90.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 15.8		Intersection LOS: B	
Intersection Capacity Utilization 37.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Manville Road & Washington Avenue



Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	273	42	20	212	54	31
Future Vol, veh/h	273	42	20	212	54	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	6	2	2	5	3	2
Mvmt Flow	420	65	31	326	83	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	485	0	841	453
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	388	-
Critical Hdwy	-	-	4.12	-	6.43	6.22
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.318
Pot Cap-1 Maneuver	-	-	1078	-	334	607
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	683	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1078	-	322	607
Mov Cap-2 Maneuver	-	-	-	-	322	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	659	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	18.9
HCM LOS			C

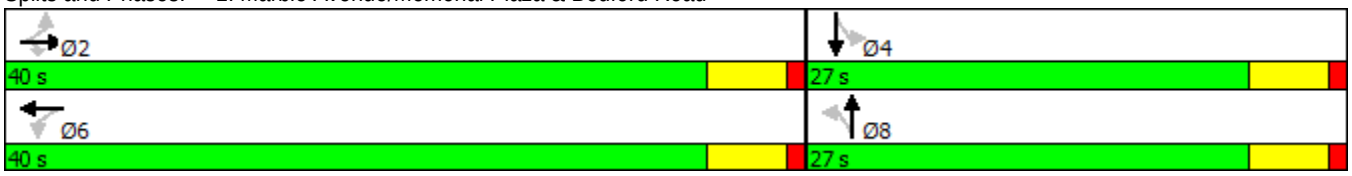
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	389	-	-	1078	-
HCM Lane V/C Ratio	0.336	-	-	0.029	-
HCM Control Delay (s)	18.9	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	282	150	75	180	80	110	92	42	22	64	27
Future Volume (vph)	49	282	150	75	180	80	110	92	42	22	64	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.954			0.953			0.967	
Flt Protected		0.993		0.950			0.950				0.990	
Satd. Flow (prot)	0	1665	1425	1593	1599	0	1593	1598	0	0	1605	0
Flt Permitted		0.909		0.479			0.793				0.911	
Satd. Flow (perm)	0	1524	1425	803	1599	0	1329	1598	0	0	1477	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			192		50			37			25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		94			294			220			454	
Travel Time (s)		2.1			6.7			5.0			10.3	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	63	362	192	96	231	103	141	118	54	28	82	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	425	192	96	334	0	141	172	0	0	145	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		27.0	27.0		27.0	27.0	
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%		40.3%	40.3%		40.3%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)		22.9	22.9	22.9	22.9		11.3	11.3			11.3	
Actuated g/C Ratio		0.51	0.51	0.51	0.51		0.25	0.25			0.25	
v/c Ratio		0.54	0.23	0.23	0.40		0.42	0.40			0.37	
Control Delay		11.6	2.4	9.1	8.1		18.4	14.2			14.8	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		11.6	2.4	9.1	8.1		18.4	14.2			14.8	
LOS		B	A	A	A		B	B			B	
Approach Delay		8.7			8.3			16.1			14.8	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		57	0	11	33		26	25			22	
Queue Length 95th (ft)		146	17	38	93		69	67			61	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		14			214			140			374	
Turn Bay Length (ft)							300					
Base Capacity (vph)		1249	1203	658	1320		685	841			773	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	
Reduced v/c Ratio		0.34	0.16	0.15	0.25		0.21	0.20			0.19	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 67			
Actuated Cycle Length: 44.6			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 68.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Marble Avenue/Memorial Plaza & Bedford Road

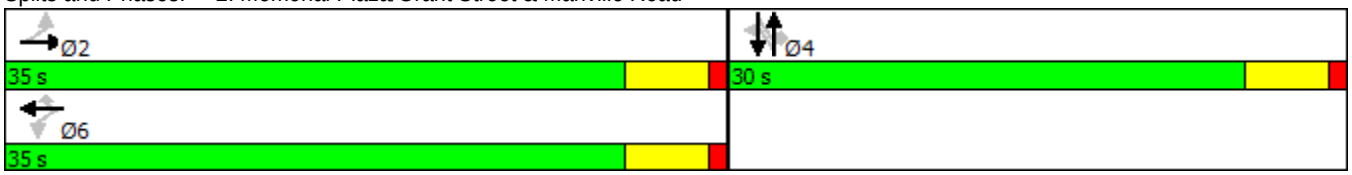


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	343	43	82	185	76	33	81	70	104	64	5
Future Volume (vph)	68	343	43	82	185	76	33	81	70	104	64	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		100	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850			0.850		0.996	
Flt Protected		0.993			0.985			0.986			0.971	
Satd. Flow (prot)	0	1607	0	0	1651	1425	0	1653	1398	0	1621	0
Flt Permitted		0.910			0.765			0.885			0.743	
Satd. Flow (perm)	0	1473	0	0	1283	1425	0	1484	1398	0	1241	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				85			79		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			174			153			410	
Travel Time (s)		4.2			4.0			3.5			9.3	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	76	385	48	92	208	85	37	91	79	117	72	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	509	0	0	300	85	0	128	79	0	195	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4		4	4		
Detector Phase	2	2		6	6	6	4	4	4	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	
Minimum Split (s)	35.0	35.0		35.0	35.0	35.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0	35.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	53.8%	53.8%		53.8%	53.8%	53.8%	46.2%	46.2%	46.2%	46.2%	46.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	
Act Effct Green (s)		32.9			32.9	32.9		14.2	14.2		14.2	
Actuated g/C Ratio		0.58			0.58	0.58		0.25	0.25		0.25	
v/c Ratio		0.60			0.41	0.10		0.35	0.19		0.63	
Control Delay		13.1			10.3	2.7		18.7	5.4		27.1	
Queue Delay		0.0			0.2	0.0		0.0	0.0		0.0	
Total Delay		13.1			10.5	2.7		18.7	5.4		27.1	
LOS		B			B	A		B	A		C	
Approach Delay		13.1			8.8			13.6			27.1	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		90			47	0		33	0		54	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		241			131	18		68	23		105	
Internal Link Dist (ft)		105			94			73			330	
Turn Bay Length (ft)						100			100			
Base Capacity (vph)		852			738	856		653	659		547	
Starvation Cap Reductn		0			78	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		0.60			0.45	0.10		0.20	0.12		0.36	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 65			
Actuated Cycle Length: 57.2			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Memorial Plaza/Grant Street & Manville Road



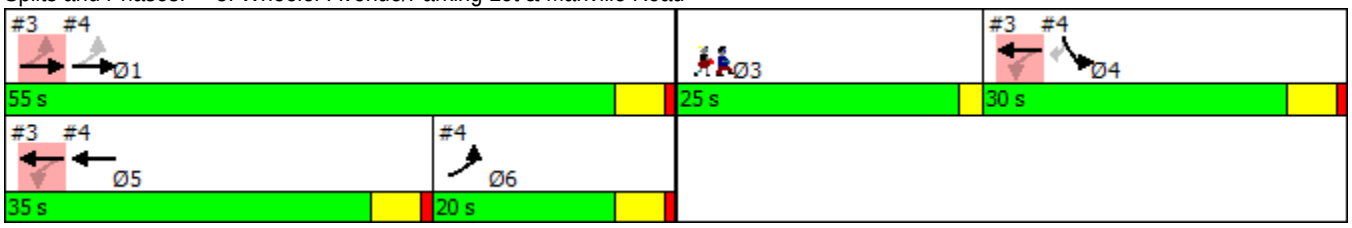
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	402	107	64	336	4	0	0	0	0	0	0
Future Volume (vph)	8	402	107	64	336	4	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	16	16	12	12	12	12	12	12	12
Storage Length (ft)	80		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.999							
Flt Protected	0.950				0.992							
Satd. Flow (prot)	1593	1784	0	0	1883	0	0	0	0	0	0	0
Flt Permitted	0.160				0.823							
Satd. Flow (perm)	268	1784	0	0	1562	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			1							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		151			119			129			120	
Travel Time (s)		3.4			2.7			2.9			2.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	2%	6%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	10	522	139	83	436	5	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	661	0	0	524	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA							
Protected Phases		1			5 4							
Permitted Phases	1			5 4								
Detector Phase	1	1		5 4	5 4							
Switch Phase												
Minimum Initial (s)	5.0	5.0										
Minimum Split (s)	55.0	55.0										
Total Split (s)	55.0	55.0										
Total Split (%)	50.0%	50.0%										
Yellow Time (s)	4.0	4.0										
All-Red Time (s)	1.0	1.0										
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	5.0	5.0										
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max										
Act Effct Green (s)	51.9	51.9			55.7							
Actuated g/C Ratio	0.57	0.57			0.62							
v/c Ratio	0.07	0.64			0.54							
Control Delay	17.8	21.2			8.3							
Queue Delay	0.0	27.1			0.8							
Total Delay	17.8	48.3			9.2							
LOS	B	D			A							
Approach Delay		47.8			9.2							
Approach LOS		D			A							

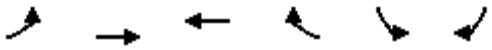
Lane Group	Ø3	Ø4	Ø5	Ø6
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Storage Length (ft)				
Storage Lanes				
Taper Length (ft)				
Lane Util. Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Peak Hour Factor				
Heavy Vehicles (%)				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	5	6
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	1.0	2.0	2.0	2.0
Minimum Split (s)	25.0	9.0	9.0	9.0
Total Split (s)	25.0	30.0	35.0	20.0
Total Split (%)	23%	27%	32%	18%
Yellow Time (s)	2.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	Max	None
Act Effct Green (s)				
Actuated g/C Ratio				
v/c Ratio				
Control Delay				
Queue Delay				
Total Delay				
LOS				
Approach Delay				
Approach LOS				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	2	164			38							
Queue Length 95th (ft)	13	431			80							
Internal Link Dist (ft)		71			39			49			40	
Turn Bay Length (ft)	80											
Base Capacity (vph)	153	1030			963							
Starvation Cap Reductn	0	389			193							
Spillback Cap Reductn	0	2			0							
Storage Cap Reductn	0	0			0							
Reduced v/c Ratio	0.07	1.03			0.68							

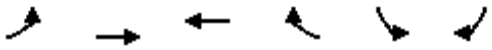
Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 90.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 30.9		Intersection LOS: C	
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Wheeler Avenue/Parking Lot & Manville Road





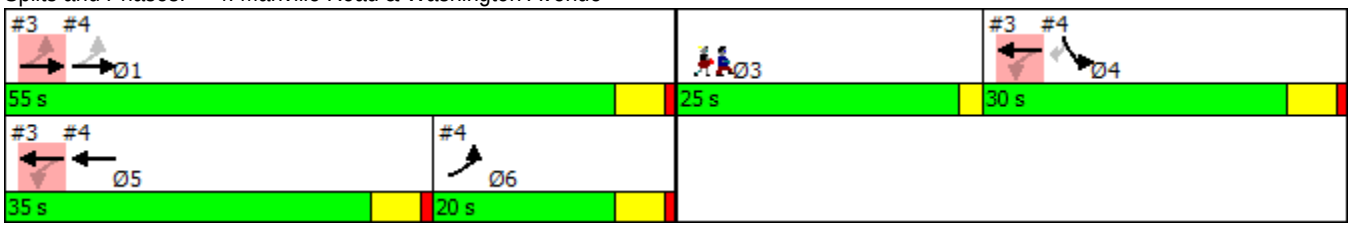
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	99	303	247	25	19	157	
Future Volume (vph)	99	303	247	25	19	157	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	
Storage Length (ft)	65			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
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)	1518	1828	1625	0	1593	1425	
Flt Permitted	0.385				0.950		
Satd. Flow (perm)	615	1828	1625	0	1593	1425	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			5			212	
Link Speed (mph)		30	30		30		
Link Distance (ft)		119	231		149		
Travel Time (s)		2.7	5.3		3.4		
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	
Heavy Vehicles (%)	7%	6%	4%	4%	2%	2%	
Adj. Flow (vph)	134	409	334	34	26	212	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	134	409	368	0	26	212	
Turn Type	pm+pt	NA	NA		Prot	Perm	
Protected Phases	6	1	5		4		3
Permitted Phases	1					4	
Detector Phase	6	1	5		4	4	
Switch Phase							
Minimum Initial (s)	2.0	5.0	2.0		2.0	2.0	1.0
Minimum Split (s)	9.0	55.0	9.0		9.0	9.0	25.0
Total Split (s)	20.0	55.0	35.0		30.0	30.0	25.0
Total Split (%)	18.2%	50.0%	31.8%		27.3%	27.3%	23%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lag		Lead		Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	None	Max	Max		None	None	None
Act Effct Green (s)	51.9	51.9	31.1		19.4	19.4	
Actuated g/C Ratio	0.57	0.57	0.34		0.21	0.21	
v/c Ratio	0.26	0.39	0.65		0.08	0.45	
Control Delay	3.5	3.1	35.8		32.5	8.4	
Queue Delay	2.6	1.2	0.2		0.0	0.2	
Total Delay	6.1	4.3	36.0		32.5	8.6	
LOS	A	A	D		C	A	
Approach Delay		4.7	36.0		11.2		
Approach LOS		A	D		B		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Queue Length 50th (ft)	4	12	141		10	0	
Queue Length 95th (ft)	11	27	281		32	27	
Internal Link Dist (ft)		39	151		69		
Turn Bay Length (ft)	65						
Base Capacity (vph)	508	1049	562		457	559	
Starvation Cap Reductn	273	409	0		0	0	
Spillback Cap Reductn	0	0	17		0	59	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.64	0.68		0.06	0.42	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 90.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 38.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Manville Road & Washington Avenue



Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	42	20	218	55	31
Future Vol, veh/h	280	42	20	218	55	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	6	2	2	5	3	2
Mvmt Flow	431	65	31	335	85	48

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	496	0	861	464
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	-	-	4.12	-	6.43	6.22
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.318
Pot Cap-1 Maneuver	-	-	1068	-	325	598
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	677	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1068	-	313	598
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	653	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	19.6
HCM LOS			C

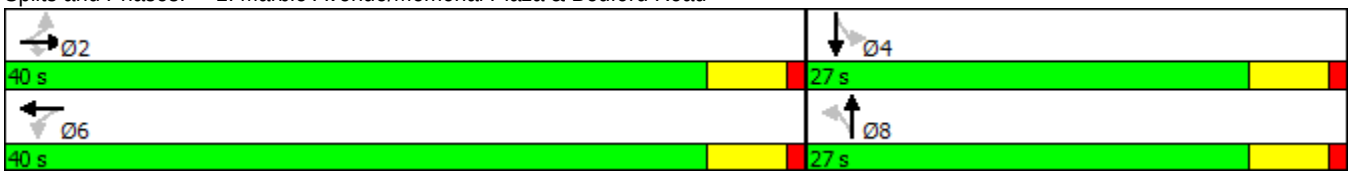
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	378	-	-	1068	-
HCM Lane V/C Ratio	0.35	-	-	0.029	-
HCM Control Delay (s)	19.6	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	296	158	79	189	84	116	97	44	23	67	28
Future Volume (vph)	51	296	158	79	189	84	116	97	44	23	67	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.954			0.953			0.968	
Flt Protected		0.993		0.950			0.950				0.990	
Satd. Flow (prot)	0	1665	1425	1593	1599	0	1593	1598	0	0	1607	0
Flt Permitted		0.907		0.460			0.773				0.910	
Satd. Flow (perm)	0	1521	1425	771	1599	0	1296	1598	0	0	1477	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			203		50			36			25	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		94			294			220			454	
Travel Time (s)		2.1			6.7			5.0			10.3	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	65	379	203	101	242	108	149	124	56	29	86	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	444	203	101	350	0	149	180	0	0	151	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		27.0	27.0		27.0	27.0	
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%		40.3%	40.3%		40.3%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)		23.6	23.6	23.6	23.6		11.7	11.7			11.7	
Actuated g/C Ratio		0.52	0.52	0.52	0.52		0.26	0.26			0.26	
v/c Ratio		0.57	0.24	0.25	0.41		0.45	0.41			0.38	
Control Delay		12.0	2.3	9.5	8.3		19.7	15.0			15.5	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		12.0	2.3	9.5	8.3		19.7	15.0			15.5	
LOS		B	A	A	A		B	B			B	
Approach Delay		9.0			8.6			17.1			15.5	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		63	0	12	37		28	26			23	
Queue Length 95th (ft)		153	17	40	98		76	73			65	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		14			214			140			374	
Turn Bay Length (ft)							300					
Base Capacity (vph)		1219	1182	618	1291		652	823			756	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	
Reduced v/c Ratio		0.36	0.17	0.16	0.27		0.23	0.22			0.20	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 67			
Actuated Cycle Length: 45.8			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 69.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Marble Avenue/Memorial Plaza & Bedford Road



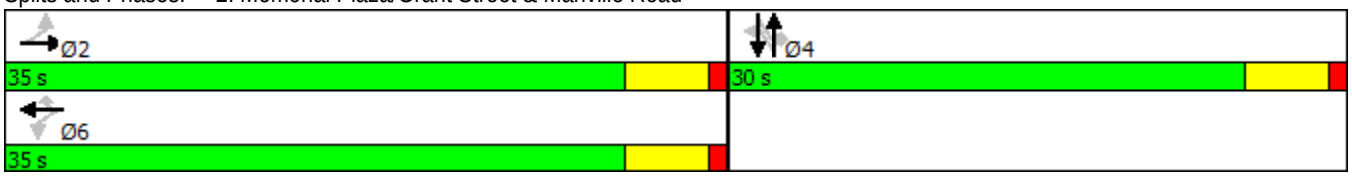
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	360	45	86	194	80	35	85	74	109	67	5
Future Volume (vph)	71	360	45	86	194	80	35	85	74	109	67	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		100	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850			0.850		0.996	
Flt Protected		0.993			0.985			0.986			0.971	
Satd. Flow (prot)	0	1607	0	0	1651	1425	0	1653	1398	0	1621	0
Flt Permitted		0.906			0.752			0.884			0.739	
Satd. Flow (perm)	0	1467	0	0	1261	1425	0	1482	1398	0	1234	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				90			83		3	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			174			153			410	
Travel Time (s)		4.2			4.0			3.5			9.3	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	80	404	51	97	218	90	39	96	83	122	75	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	535	0	0	315	90	0	135	83	0	203	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4		4	4		
Detector Phase	2	2		6	6	6	4	4	4	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	
Minimum Split (s)	35.0	35.0		35.0	35.0	35.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0	35.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	53.8%	53.8%		53.8%	53.8%	53.8%	46.2%	46.2%	46.2%	46.2%	46.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	
Act Effct Green (s)		32.6			32.6	32.6		14.6	14.6		14.6	
Actuated g/C Ratio		0.57			0.57	0.57		0.25	0.25		0.25	
v/c Ratio		0.64			0.44	0.11		0.36	0.20		0.64	
Control Delay		14.8			11.2	2.7		18.7	5.2		27.3	
Queue Delay		0.0			0.2	0.0		0.0	0.0		0.0	
Total Delay		14.8			11.3	2.7		18.7	5.2		27.3	
LOS		B			B	A		B	A		C	
Approach Delay		14.8			9.4			13.6			27.3	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		100			51	0		35	0		56	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		#311			145	19		70	23		109	
Internal Link Dist (ft)		105			94			73			330	
Turn Bay Length (ft)						100			100			
Base Capacity (vph)		839			717	849		651	660		543	
Starvation Cap Reductn		0			68	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		0.64			0.49	0.11		0.21	0.13		0.37	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 65			
Actuated Cycle Length: 57.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 75.2%		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: 2: Memorial Plaza/Grant Street & Manville Road

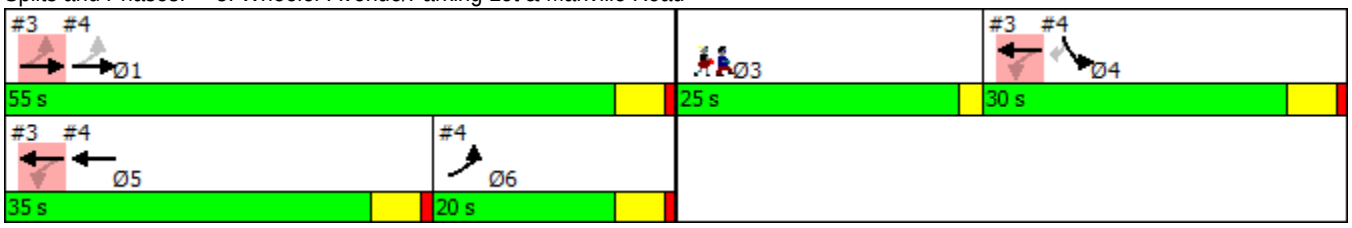


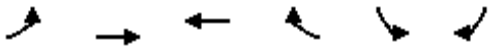
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	422	112	67	353	4	0	0	0	0	0	0
Future Volume (vph)	8	422	112	67	353	4	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	16	16	12	12	12	12	12	12	12
Storage Length (ft)	80		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969			0.999							
Flt Protected	0.950				0.992							
Satd. Flow (prot)	1593	1786	0	0	1883	0	0	0	0	0	0	0
Flt Permitted	0.160				0.814							
Satd. Flow (perm)	268	1786	0	0	1545	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			1							
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		151			119			129			120	
Travel Time (s)		3.4			2.7			2.9			2.7	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	2%	6%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	10	548	145	87	458	5	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	693	0	0	550	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA							
Protected Phases		1			5 4							
Permitted Phases	1			5 4								
Detector Phase	1	1		5 4	5 4							
Switch Phase												
Minimum Initial (s)	5.0	5.0										
Minimum Split (s)	55.0	55.0										
Total Split (s)	55.0	55.0										
Total Split (%)	50.0%	50.0%										
Yellow Time (s)	4.0	4.0										
All-Red Time (s)	1.0	1.0										
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	5.0	5.0										
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max										
Act Effct Green (s)	51.8	51.8			56.3							
Actuated g/C Ratio	0.57	0.57			0.62							
v/c Ratio	0.07	0.68			0.58							
Control Delay	17.9	22.5			9.9							
Queue Delay	0.0	39.3			0.9							
Total Delay	17.9	61.8			10.9							
LOS	B	E			B							
Approach Delay		61.2			10.9							
Approach LOS		E			B							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	2	187			41							
Queue Length 95th (ft)	13	461			83							
Internal Link Dist (ft)		71			39			49			40	
Turn Bay Length (ft)	80											
Base Capacity (vph)	152	1023			955							
Starvation Cap Reductn	0	374			183							
Spillback Cap Reductn	0	2			0							
Storage Cap Reductn	0	0			0							
Reduced v/c Ratio	0.07	1.07			0.71							

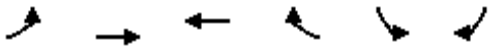
Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 91			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 39.1		Intersection LOS: D	
Intersection Capacity Utilization 65.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Wheeler Avenue/Parking Lot & Manville Road





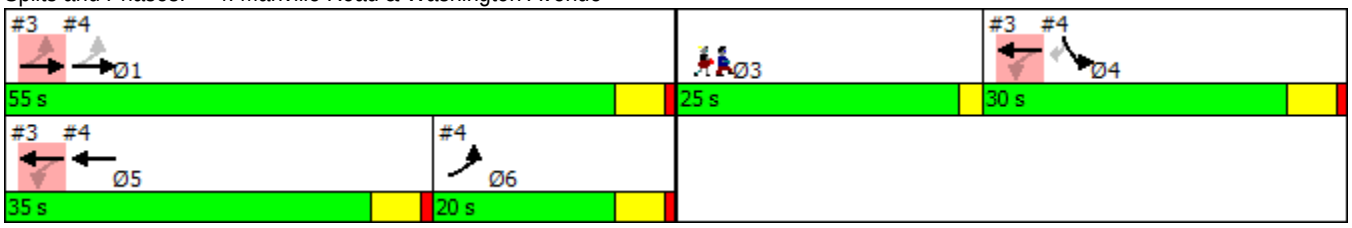
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	104	318	259	26	20	165	
Future Volume (vph)	104	318	259	26	20	165	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	
Storage Length (ft)	65			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
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)	1518	1828	1625	0	1593	1425	
Flt Permitted	0.363				0.950		
Satd. Flow (perm)	580	1828	1625	0	1593	1425	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			4			223	
Link Speed (mph)		30	30		30		
Link Distance (ft)		119	231		149		
Travel Time (s)		2.7	5.3		3.4		
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	
Heavy Vehicles (%)	7%	6%	4%	4%	2%	2%	
Adj. Flow (vph)	141	430	350	35	27	223	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	141	430	385	0	27	223	
Turn Type	pm+pt	NA	NA		Prot	Perm	
Protected Phases	6	1	5		4		3
Permitted Phases	1					4	
Detector Phase	6	1	5		4	4	
Switch Phase							
Minimum Initial (s)	2.0	5.0	2.0		2.0	2.0	1.0
Minimum Split (s)	9.0	55.0	9.0		9.0	9.0	25.0
Total Split (s)	20.0	55.0	35.0		30.0	30.0	25.0
Total Split (%)	18.2%	50.0%	31.8%		27.3%	27.3%	23%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lag		Lead		Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	None	Max	Max		None	None	None
Act Effct Green (s)	51.8	51.8	31.1		20.1	20.1	
Actuated g/C Ratio	0.57	0.57	0.34		0.22	0.22	
v/c Ratio	0.29	0.41	0.69		0.08	0.46	
Control Delay	3.7	3.2	37.5		32.5	8.2	
Queue Delay	3.0	1.4	0.4		0.0	0.2	
Total Delay	6.7	4.6	38.0		32.5	8.5	
LOS	A	A	D		C	A	
Approach Delay		5.1	38.0		11.1		
Approach LOS		A	D		B		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Queue Length 50th (ft)	4	12	154		10	0	
Queue Length 95th (ft)	12	29	296		33	26	
Internal Link Dist (ft)		39	151		69		
Turn Bay Length (ft)	65						
Base Capacity (vph)	490	1040	557		453	565	
Starvation Cap Reductn	257	402	0		0	0	
Spillback Cap Reductn	0	0	24		0	64	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.61	0.67	0.72		0.06	0.45	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 91			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 39.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Manville Road & Washington Avenue



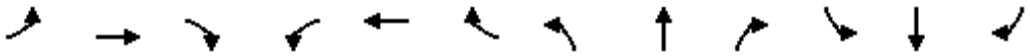
Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	294	44	21	229	58	33
Future Vol, veh/h	294	44	21	229	58	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	6	2	2	5	3	2
Mvmt Flow	452	68	32	352	89	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	520	0	902	486
Stage 1	-	-	-	-	486	-
Stage 2	-	-	-	-	416	-
Critical Hdwy	-	-	4.12	-	6.43	6.22
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.218	-	3.527	3.318
Pot Cap-1 Maneuver	-	-	1046	-	307	581
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	664	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1046	-	295	581
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	639	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	21.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	359	-	-	1046	-
HCM Lane V/C Ratio	0.39	-	-	0.031	-
HCM Control Delay (s)	21.3	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.1	-



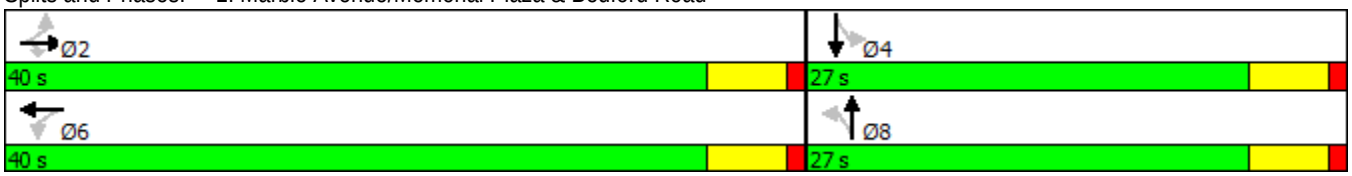
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	221	118	76	328	95	261	156	54	28	84	55
Future Volume (vph)	95	221	118	76	328	95	261	156	54	28	84	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.966			0.962			0.955	
Flt Protected		0.985		0.950			0.950				0.992	
Satd. Flow (prot)	0	1640	1358	1562	1616	0	1593	1574	0	0	1495	0
Flt Permitted		0.724		0.525			0.708				0.925	
Satd. Flow (perm)	0	1205	1358	863	1616	0	1187	1574	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			126		33			27			40	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		94			294			312			454	
Travel Time (s)		2.1			6.7			7.1			10.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	7%	4%	2%	3%	2%	3%	9%	11%	7%	9%
Adj. Flow (vph)	101	235	126	81	349	101	278	166	57	30	89	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	336	126	81	450	0	278	223	0	0	178	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		27.0	27.0		27.0	27.0	
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%		40.3%	40.3%		40.3%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)		22.8	22.8	22.8	22.8		17.7	17.7			17.7	
Actuated g/C Ratio		0.45	0.45	0.45	0.45		0.35	0.35			0.35	
v/c Ratio		0.62	0.19	0.21	0.60		0.67	0.39			0.35	
Control Delay		17.6	3.0	11.1	14.5		24.5	13.7			12.3	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		17.6	3.0	11.1	14.5		24.5	13.7			12.3	
LOS		B	A	B	B		C	B			B	
Approach Delay		13.6			14.0			19.7			12.3	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		75	0	14	92		61	37			26	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		159	22	39	181		#188	106			82	
Internal Link Dist (ft)		14			214			232			374	
Turn Bay Length (ft)							300					
Base Capacity (vph)		850	995	609	1150		526	713			640	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	
Reduced v/c Ratio		0.40	0.13	0.13	0.39		0.53	0.31			0.28	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 67			
Actuated Cycle Length: 50.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 87.5%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 1: Marble Avenue/Memorial Plaza & Bedford Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	233	47	81	267	143	39	142	0	56	29	7
Future Volume (vph)	140	233	47	81	267	143	39	142	0	56	29	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.961						0.990	
Flt Protected		0.984			0.992			0.989			0.970	
Satd. Flow (prot)	0	1599	0	0	1598	0	0	1658	0	0	1610	0
Flt Permitted		0.736			0.872			0.912			0.746	
Satd. Flow (perm)	0	1196	0	0	1405	0	0	1529	0	0	1238	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			42						7	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			174			153			410	
Travel Time (s)		4.2			4.0			3.5			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	147	245	49	85	281	151	41	149	0	59	31	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	441	0	0	517	0	0	190	0	0	97	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Detector Phase	2	2		6	6		4	4		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		27.0	27.0		27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0		30.0	30.0		30.0	30.0	
Total Split (%)	53.8%	53.8%		53.8%	53.8%		46.2%	46.2%		46.2%	46.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max		None	None		None	None	
Act Effct Green (s)		33.0			33.0			12.7			12.7	
Actuated g/C Ratio		0.59			0.59			0.23			0.23	
v/c Ratio		0.62			0.61			0.54			0.34	
Control Delay		14.5			12.5			23.7			18.3	
Queue Delay		0.0			0.7			0.0			0.0	
Total Delay		14.5			13.2			23.7			18.3	
LOS		B			B			C			B	
Approach Delay		14.5			13.2			23.7			18.3	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)		72			78			51			23	
Queue Length 95th (ft)		#274			#268			98			53	
Internal Link Dist (ft)		105			94			73			330	
Turn Bay Length (ft)												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		711			847			691			563	
Starvation Cap Reductn		0			105			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.62			0.70			0.27			0.17	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 65			
Actuated Cycle Length: 55.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 68.2%		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: Memorial Plaza/Grant Street & Manville Road

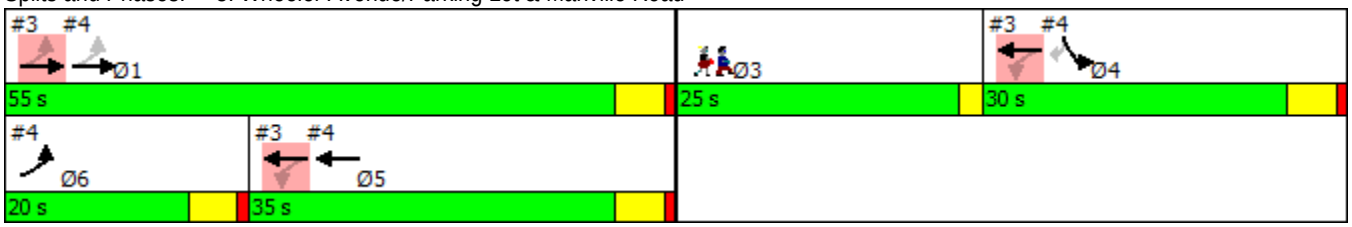
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	368	89	45	491	3	0	0	0	0	0	0
Future Volume (vph)	20	368	89	45	491	3	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	16	16	12	12	12	12	12	12	12
Storage Length (ft)	80		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.999							
Flt Protected	0.950				0.996							
Satd. Flow (prot)	1593	1845	0	0	1891	0	0	0	0	0	0	0
Flt Permitted	0.309				0.934							
Satd. Flow (perm)	518	1845	0	0	1773	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		151			119			129			120	
Travel Time (s)		3.4			2.7			2.9			2.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.77	0.77	0.77	0.95	0.95	0.95
Adj. Flow (vph)	21	387	94	47	517	3	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	481	0	0	567	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA							
Protected Phases		1			5 4							
Permitted Phases	1			5 4								
Detector Phase	1	1		5 4	5 4							
Switch Phase												
Minimum Initial (s)	5.0	5.0										
Minimum Split (s)	55.0	55.0										
Total Split (s)	55.0	55.0										
Total Split (%)	50.0%	50.0%										
Yellow Time (s)	4.0	4.0										
All-Red Time (s)	1.0	1.0										
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	5.0	5.0										
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max										
Act Effct Green (s)	53.1	53.1			55.0							
Actuated g/C Ratio	0.62	0.62			0.64							
v/c Ratio	0.07	0.42			0.50							
Control Delay	15.8	14.9			5.1							
Queue Delay	0.0	2.9			0.3							
Total Delay	15.8	17.8			5.3							
LOS	B	B			A							
Approach Delay		17.7			5.3							
Approach LOS		B			A							
Queue Length 50th (ft)	2	56			17							

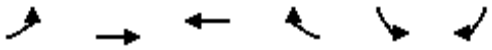
Lane Group	Ø3	Ø4	Ø5	Ø6
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Storage Length (ft)				
Storage Lanes				
Taper Length (ft)				
Lane Util. Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Peak Hour Factor				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	5	6
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	2.0	2.0	2.0
Minimum Split (s)	25.0	9.0	9.0	9.0
Total Split (s)	25.0	30.0	35.0	20.0
Total Split (%)	23%	27%	32%	18%
Yellow Time (s)	2.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	Max	None
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)				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	25	351			101							
Internal Link Dist (ft)		71			39			49			40	
Turn Bay Length (ft)	80											
Base Capacity (vph)	322	1153			1404							
Starvation Cap Reductn	0	544			297							
Spillback Cap Reductn	0	2			0							
Storage Cap Reductn	0	0			0							
Reduced v/c Ratio	0.07	0.79			0.51							

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 85.3			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 67.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Wheeler Avenue/Parking Lot & Manville Road





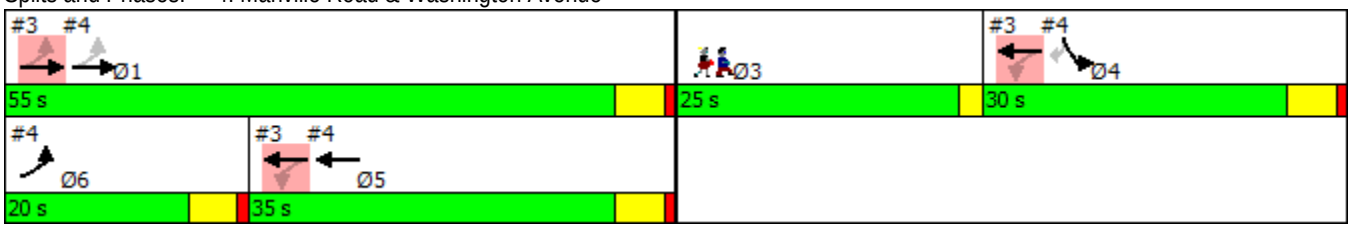
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	151	233	333	30	25	158	
Future Volume (vph)	151	233	333	30	25	158	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	
Storage Length (ft)	65			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.989			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1593	1882	1492	0	1406	1283	
Flt Permitted	0.336				0.950		
Satd. Flow (perm)	563	1882	1492	0	1406	1283	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			4			186	
Link Speed (mph)		30	30		30		
Link Distance (ft)		119	231		238		
Travel Time (s)		2.7	5.3		5.4		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	
Parking (#/hr)			0	0	0	0	
Adj. Flow (vph)	178	274	392	35	29	186	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	178	274	427	0	29	186	
Turn Type	pm+pt	NA	NA		Prot	Perm	
Protected Phases	6	1	5		4		3
Permitted Phases	1					4	
Detector Phase	6	1	5		4	4	
Switch Phase							
Minimum Initial (s)	2.0	5.0	2.0		2.0	2.0	5.0
Minimum Split (s)	9.0	55.0	9.0		9.0	9.0	25.0
Total Split (s)	20.0	55.0	35.0		30.0	30.0	25.0
Total Split (%)	18.2%	50.0%	31.8%		27.3%	27.3%	23%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead		Lag		Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	None	Max	Max		None	None	None
Act Effct Green (s)	53.1	53.1	37.8		13.4	13.4	
Actuated g/C Ratio	0.62	0.62	0.44		0.16	0.16	
v/c Ratio	0.38	0.23	0.64		0.13	0.52	
Control Delay	5.6	3.2	32.2		34.4	11.1	
Queue Delay	0.6	1.3	0.2		0.0	0.1	
Total Delay	6.3	4.5	32.4		34.4	11.1	
LOS	A	A	C		C	B	
Approach Delay		5.2	32.4		14.3		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Approach LOS		A	C		B		
Queue Length 50th (ft)	6	9	105		11	0	
Queue Length 95th (ft)	21	30	#490		40	48	
Internal Link Dist (ft)		39	151		158		
Turn Bay Length (ft)	65						
Base Capacity (vph)	542	1170	664		437	526	
Starvation Cap Reductn	144	687	0		0	0	
Spillback Cap Reductn	0	0	19		0	23	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.45	0.57	0.66		0.07	0.37	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 85.3			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 4: Manville Road & Washington Avenue



Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	224	34	40	309	68	34
Future Vol, veh/h	224	34	40	309	68	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	7	2	2	6	2	2
Mvmt Flow	264	40	47	364	80	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	742	284
Stage 1	-	-	-	-	284	-
Stage 2	-	-	-	-	458	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1257	-	383	755
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	637	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	365	755
Mov Cap-2 Maneuver	-	-	-	-	365	-
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	441	-	-	1257	-
HCM Lane V/C Ratio	0.272	-	-	0.037	-
HCM Control Delay (s)	16.2	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	87	35	300	51	37	8	0	1832	55	0	1668	0
Future Volume (vph)	87	35	300	51	37	8	0	1832	55	0	1668	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.904			0.989				0.850			
Flt Protected		0.990			0.974							
Satd. Flow (prot)	0	1667	0	0	1794	0	0	3539	1583	0	3539	0
Flt Permitted		0.907			0.623							
Satd. Flow (perm)	0	1527	0	0	1148	0	0	3539	1583	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			6				95			
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		410			163			581			563	
Travel Time (s)		9.3			3.7			8.8			8.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	91	36	313	53	39	8	0	1908	57	0	1738	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	440	0	0	100	0	0	1908	57	0	1738	0
Turn Type	Perm	NA		Perm	NA			NA	Free		NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4					Free			
Detector Phase	4	4		4	4			2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			50.0			50.0	
Total Split (s)	30.0	30.0		30.0	30.0			50.0			50.0	
Total Split (%)	37.5%	37.5%		37.5%	37.5%			62.5%			62.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0			1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			Max			Max	
Act Effct Green (s)		24.1			24.1			45.0	79.1		45.0	
Actuated g/C Ratio		0.30			0.30			0.57	1.00		0.57	
v/c Ratio		0.93			0.28			0.95	0.04		0.86	
Control Delay		55.9			22.1			28.5	0.0		20.7	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		55.9			22.1			28.5	0.0		20.7	
LOS		E			C			C	A		C	
Approach Delay		55.9			22.1			27.7			20.7	
Approach LOS		E			C			C			C	
Queue Length 50th (ft)		205			35			439	0		361	
Queue Length 95th (ft)		#382			74			#642	0		475	
Internal Link Dist (ft)		330			83			501			483	
Turn Bay Length (ft)												
Base Capacity (vph)		489			366			2013	1583		2013	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
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		0.90			0.27			0.95	0.04		0.86	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 79.1			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 27.6		Intersection LOS: C	
Intersection Capacity Utilization 84.8%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 6: Sawmill River Parkway & Grant Street

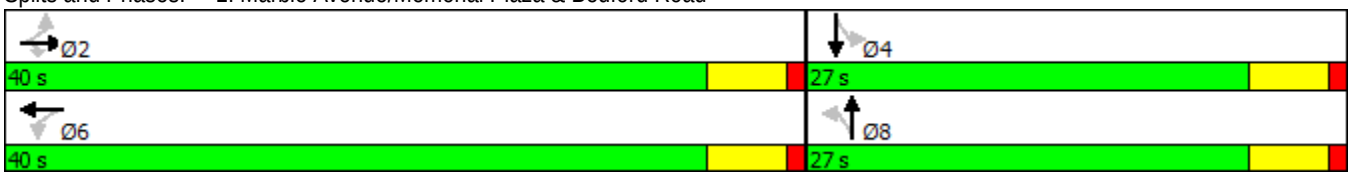
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	227	119	77	335	96	264	162	55	28	85	56
Future Volume (vph)	96	227	119	77	335	96	264	162	55	28	85	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.967			0.962			0.955	
Flt Protected		0.985		0.950			0.950				0.992	
Satd. Flow (prot)	0	1640	1358	1562	1618	0	1593	1574	0	0	1495	0
Flt Permitted		0.714		0.517			0.703				0.925	
Satd. Flow (perm)	0	1189	1358	850	1618	0	1179	1574	0	0	1394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		32			27			40	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		94			294			312			454	
Travel Time (s)		2.1			6.7			7.1			10.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	7%	4%	2%	3%	2%	3%	9%	11%	7%	9%
Adj. Flow (vph)	102	241	127	82	356	102	281	172	59	30	90	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	343	127	82	458	0	281	231	0	0	180	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		27.0	27.0		27.0	27.0	
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%		40.3%	40.3%		40.3%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)		23.1	23.1	23.1	23.1		17.9	17.9			17.9	
Actuated g/C Ratio		0.45	0.45	0.45	0.45		0.35	0.35			0.35	
v/c Ratio		0.64	0.19	0.21	0.61		0.68	0.41			0.35	
Control Delay		18.3	2.9	11.2	14.8		25.5	14.2			12.6	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		18.3	2.9	11.2	14.8		25.5	14.2			12.6	
LOS		B	A	B	B		C	B			B	
Approach Delay		14.1			14.2			20.4			12.6	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)		80	0	15	97		61	39			26	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		164	22	40	185		#198	113			85	
Internal Link Dist (ft)		14			214			232			374	
Turn Bay Length (ft)							300					
Base Capacity (vph)		831	987	594	1140		518	706			635	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	
Reduced v/c Ratio		0.41	0.13	0.14	0.40		0.54	0.33			0.28	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 67			
Actuated Cycle Length: 51.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 88.7%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 1: Marble Avenue/Memorial Plaza & Bedford Road



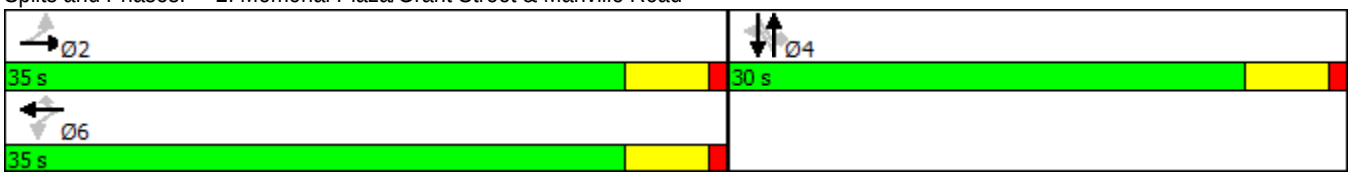
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	239	47	82	274	144	39	143	180	57	29	9
Future Volume (vph)	143	239	47	82	274	144	39	143	180	57	29	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		100	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985				0.850			0.850		0.988	
Flt Protected		0.984			0.989			0.989			0.971	
Satd. Flow (prot)	0	1599	0	0	1658	1425	0	1658	1398	0	1608	0
Flt Permitted		0.764			0.829			0.913			0.726	
Satd. Flow (perm)	0	1241	0	0	1390	1425	0	1531	1398	0	1203	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				152			189		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			174			153			410	
Travel Time (s)		4.2			4.0			3.5			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	151	252	49	86	288	152	41	151	189	60	31	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	452	0	0	374	152	0	192	189	0	100	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4		4	4		
Detector Phase	2	2		6	6	6	4	4	4	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	
Minimum Split (s)	35.0	35.0		35.0	35.0	35.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0	35.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	53.8%	53.8%		53.8%	53.8%	53.8%	46.2%	46.2%	46.2%	46.2%	46.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	
Act Effct Green (s)		31.5			31.5	31.5		12.9	12.9		12.9	
Actuated g/C Ratio		0.58			0.58	0.58		0.24	0.24		0.24	
v/c Ratio		0.63			0.47	0.17		0.53	0.40		0.34	
Control Delay		14.6			10.5	2.3		22.7	5.5		18.1	
Queue Delay		0.0			0.3	0.0		0.0	0.0		0.0	
Total Delay		14.6			10.9	2.3		22.7	5.5		18.1	
LOS		B			B	A		C	A		B	
Approach Delay		14.6			8.4			14.2			18.1	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		78			58	0		52	0		23	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		#274			166	25		99	36		55	
Internal Link Dist (ft)		105			94			73			330	
Turn Bay Length (ft)						100			100			
Base Capacity (vph)		723			803	887		706	746		559	
Starvation Cap Reductn		0			116	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		0.63			0.54	0.17		0.27	0.25		0.18	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 65			
Actuated Cycle Length: 54.5			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 80.2%		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: 2: Memorial Plaza/Grant Street & Manville Road



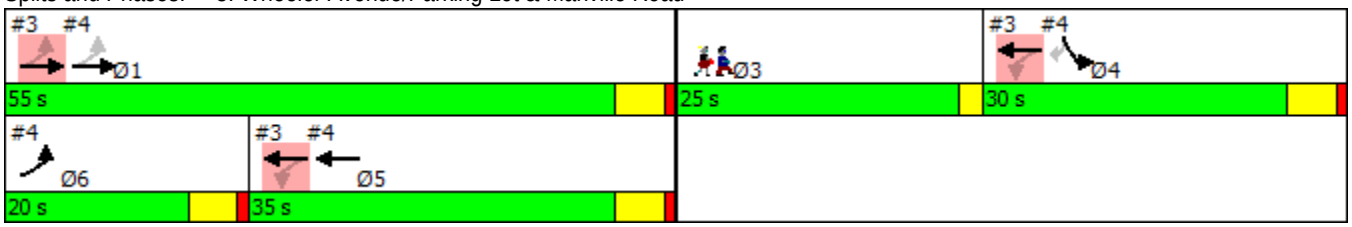
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	376	90	45	500	3	0	0	0	0	0	0
Future Volume (vph)	20	376	90	45	500	3	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	16	16	12	12	12	12	12	12	12
Storage Length (ft)	80		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.999							
Flt Protected	0.950				0.996							
Satd. Flow (prot)	1593	1845	0	0	1891	0	0	0	0	0	0	0
Flt Permitted	0.304				0.934							
Satd. Flow (perm)	510	1845	0	0	1773	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		151			119			129			120	
Travel Time (s)		3.4			2.7			2.9			2.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.77	0.77	0.77	0.95	0.95	0.95
Adj. Flow (vph)	21	396	95	47	526	3	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	491	0	0	576	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA							
Protected Phases		1			5 4							
Permitted Phases	1			5 4								
Detector Phase	1	1		5 4	5 4							
Switch Phase												
Minimum Initial (s)	5.0	5.0										
Minimum Split (s)	55.0	55.0										
Total Split (s)	55.0	55.0										
Total Split (%)	50.0%	50.0%										
Yellow Time (s)	4.0	4.0										
All-Red Time (s)	1.0	1.0										
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	5.0	5.0										
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max										
Act Effct Green (s)	53.1	53.1			55.1							
Actuated g/C Ratio	0.62	0.62			0.64							
v/c Ratio	0.07	0.43			0.50							
Control Delay	15.8	15.2			5.4							
Queue Delay	0.0	3.1			0.3							
Total Delay	15.8	18.3			5.7							
LOS	B	B			A							
Approach Delay		18.2			5.7							
Approach LOS		B			A							
Queue Length 50th (ft)	2	58			17							

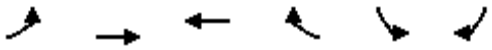
Lane Group	Ø3	Ø4	Ø5	Ø6
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Storage Length (ft)				
Storage Lanes				
Taper Length (ft)				
Lane Util. Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Peak Hour Factor				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	5	6
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	2.0	2.0	2.0
Minimum Split (s)	25.0	9.0	9.0	9.0
Total Split (s)	25.0	30.0	35.0	20.0
Total Split (%)	23%	27%	32%	18%
Yellow Time (s)	2.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	Max	None
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)				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	25	361			111							
Internal Link Dist (ft)		71			39			49			40	
Turn Bay Length (ft)	80											
Base Capacity (vph)	316	1151			1402							
Starvation Cap Reductn	0	539			296							
Spillback Cap Reductn	0	9			0							
Storage Cap Reductn	0	0			0							
Reduced v/c Ratio	0.07	0.80			0.52							

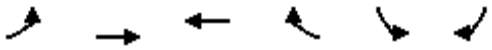
Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 85.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Wheeler Avenue/Parking Lot & Manville Road





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	153	239	340	30	25	160	
Future Volume (vph)	153	239	340	30	25	160	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	
Storage Length (ft)	65			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.989			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1593	1882	1492	0	1406	1283	
Flt Permitted	0.328				0.950		
Satd. Flow (perm)	550	1882	1492	0	1406	1283	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			4			188	
Link Speed (mph)		30	30		30		
Link Distance (ft)		119	231		238		
Travel Time (s)		2.7	5.3		5.4		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	
Parking (#/hr)			0	0	0	0	
Adj. Flow (vph)	180	281	400	35	29	188	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	180	281	435	0	29	188	
Turn Type	pm+pt	NA	NA		Prot	Perm	
Protected Phases	6	1	5		4		3
Permitted Phases	1					4	
Detector Phase	6	1	5		4	4	
Switch Phase							
Minimum Initial (s)	2.0	5.0	2.0		2.0	2.0	5.0
Minimum Split (s)	9.0	55.0	9.0		9.0	9.0	25.0
Total Split (s)	20.0	55.0	35.0		30.0	30.0	25.0
Total Split (%)	18.2%	50.0%	31.8%		27.3%	27.3%	23%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead		Lag		Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	None	Max	Max		None	None	None
Act Effct Green (s)	53.1	53.1	37.8		13.5	13.5	
Actuated g/C Ratio	0.62	0.62	0.44		0.16	0.16	
v/c Ratio	0.39	0.24	0.66		0.13	0.52	
Control Delay	5.8	3.1	32.7		34.4	11.1	
Queue Delay	0.6	1.3	0.2		0.0	0.1	
Total Delay	6.4	4.4	32.9		34.4	11.1	
LOS	A	A	C		C	B	
Approach Delay		5.2	32.9		14.2		

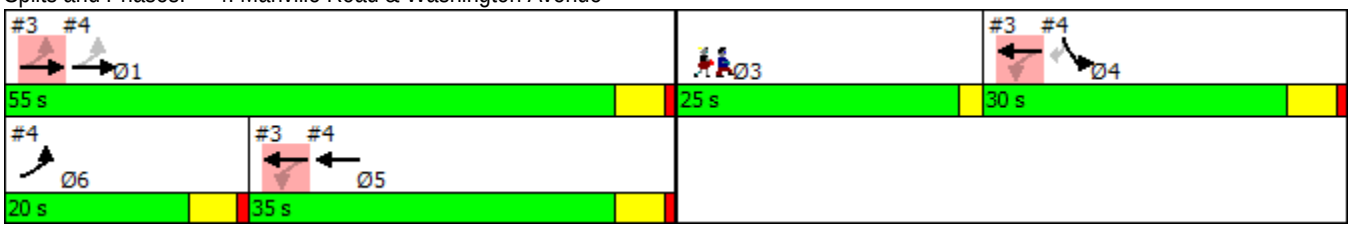


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Approach LOS		A	C		B		
Queue Length 50th (ft)	6	9	109		11	0	
Queue Length 95th (ft)	21	30	#504		40	49	
Internal Link Dist (ft)		39	151		158		
Turn Bay Length (ft)	65						
Base Capacity (vph)	536	1169	662		436	528	
Starvation Cap Reductn	138	676	0		0	0	
Spillback Cap Reductn	0	0	21		0	24	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.45	0.57	0.68		0.07	0.37	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 85.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 47.2%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 4: Manville Road & Washington Avenue



Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	230	34	40	316	70	34
Future Vol, veh/h	230	34	40	316	70	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	7	2	2	6	2	2
Mvmt Flow	271	40	47	372	82	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	311	0	757	291
Stage 1	-	-	-	-	291	-
Stage 2	-	-	-	-	466	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1249	-	375	748
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1249	-	357	748
Mov Cap-2 Maneuver	-	-	-	-	357	-
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	431	-	-	1249	-
HCM Lane V/C Ratio	0.284	-	-	0.038	-
HCM Control Delay (s)	16.6	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.1	-

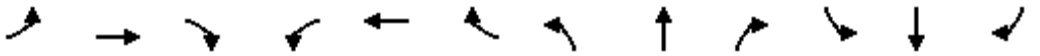
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	88	35	305	52	37	8	0	1850	58	0	1685	0
Future Volume (vph)	88	35	305	52	37	8	0	1850	58	0	1685	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.904			0.989				0.850			
Flt Protected		0.990			0.974							
Satd. Flow (prot)	0	1667	0	0	1794	0	0	3539	1583	0	3539	0
Flt Permitted		0.907			0.616							
Satd. Flow (perm)	0	1527	0	0	1135	0	0	3539	1583	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			6				95			
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		410			163			581			563	
Travel Time (s)		9.3			3.7			8.8			8.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	92	36	318	54	39	8	0	1927	60	0	1755	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	446	0	0	101	0	0	1927	60	0	1755	0
Turn Type	Perm	NA		Perm	NA			NA	Free		NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4					Free			
Detector Phase	4	4		4	4			2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			50.0			50.0	
Total Split (s)	30.0	30.0		30.0	30.0			50.0			50.0	
Total Split (%)	37.5%	37.5%		37.5%	37.5%			62.5%			62.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0			1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			Max			Max	
Act Effct Green (s)		24.3			24.3			45.0	79.3		45.0	
Actuated g/C Ratio		0.31			0.31			0.57	1.00		0.57	
v/c Ratio		0.94			0.29			0.96	0.04		0.87	
Control Delay		57.2			22.2			30.4	0.1		21.4	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		57.2			22.2			30.4	0.1		21.4	
LOS		E			C			C	A		C	
Approach Delay		57.2			22.2			29.4			21.4	
Approach LOS		E			C			C			C	
Queue Length 50th (ft)		209			35			448	0		370	
Queue Length 95th (ft)		#389			75			#653	0		#487	
Internal Link Dist (ft)		330			83			501			483	
Turn Bay Length (ft)												
Base Capacity (vph)		488			361			2008	1583		2008	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
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		0.91			0.28			0.96	0.04		0.87	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 79.3			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 28.9		Intersection LOS: C	
Intersection Capacity Utilization 85.6%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 6: Sawmill River Parkway & Grant Street



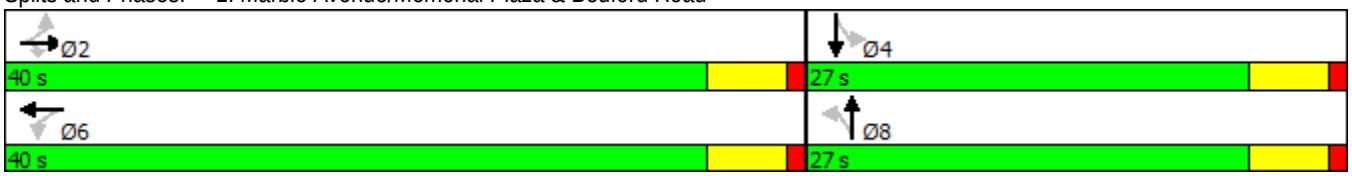
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	238	125	81	352	101	277	170	58	29	89	59
Future Volume (vph)	101	238	125	81	352	101	277	170	58	29	89	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	300		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.967			0.962			0.955	
Flt Protected		0.985		0.950			0.950				0.992	
Satd. Flow (prot)	0	1640	1358	1562	1618	0	1593	1574	0	0	1496	0
Flt Permitted		0.669		0.494			0.682				0.924	
Satd. Flow (perm)	0	1114	1358	812	1618	0	1143	1574	0	0	1393	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			133		32			27			40	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		94			294			312			454	
Travel Time (s)		2.1			6.7			7.1			10.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	7%	4%	2%	3%	2%	3%	9%	11%	7%	9%
Adj. Flow (vph)	107	253	133	86	374	107	295	181	62	31	95	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	360	133	86	481	0	295	243	0	0	189	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6			8			4		
Detector Phase	2	2	2	6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	20.0	20.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	27.0		27.0	27.0		27.0	27.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0		27.0	27.0		27.0	27.0	
Total Split (%)	59.7%	59.7%	59.7%	59.7%	59.7%		40.3%	40.3%		40.3%	40.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min		None	None		None	None	
Act Effct Green (s)		24.4	24.4	24.4	24.4		19.3	19.3			19.3	
Actuated g/C Ratio		0.45	0.45	0.45	0.45		0.36	0.36			0.36	
v/c Ratio		0.72	0.19	0.23	0.64		0.72	0.42			0.36	
Control Delay		21.7	2.7	11.4	15.5		29.2	15.2			13.4	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		21.7	2.7	11.4	15.5		29.2	15.2			13.4	
LOS		C	A	B	B		C	B			B	
Approach Delay		16.6			14.9			22.9			13.4	
Approach LOS		B			B			C			B	
Queue Length 50th (ft)		96	0	17	114		71	45			30	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		183	22	41	195		#232	128			96	
Internal Link Dist (ft)		14			214			232			374	
Turn Bay Length (ft)							300					
Base Capacity (vph)		741	948	540	1087		478	674			606	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	
Reduced v/c Ratio		0.49	0.14	0.16	0.44		0.62	0.36			0.31	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 67			
Actuated Cycle Length: 53.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 92.2%		ICU Level of Service F	
Analysis Period (min) 15			

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

Splits and Phases: 1: Marble Avenue/Memorial Plaza & Bedford Road



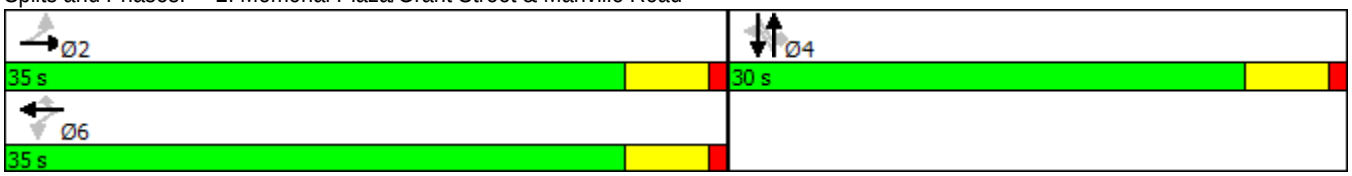
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	251	49	86	288	151	41	150	189	60	30	9
Future Volume (vph)	150	251	49	86	288	151	41	150	189	60	30	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		100	0		100	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985				0.850			0.850		0.988	
Flt Protected		0.984			0.989			0.989			0.971	
Satd. Flow (prot)	0	1599	0	0	1658	1425	0	1658	1398	0	1608	0
Flt Permitted		0.754			0.819			0.912			0.720	
Satd. Flow (perm)	0	1225	0	0	1373	1425	0	1529	1398	0	1193	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				159			199		9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		185			174			153			410	
Travel Time (s)		4.2			4.0			3.5			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Adj. Flow (vph)	158	264	52	91	303	159	43	158	199	63	32	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	474	0	0	394	159	0	201	199	0	104	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6		6	4		4	4		
Detector Phase	2	2		6	6	6	4	4	4	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	
Minimum Split (s)	35.0	35.0		35.0	35.0	35.0	27.0	27.0	27.0	27.0	27.0	
Total Split (s)	35.0	35.0		35.0	35.0	35.0	30.0	30.0	30.0	30.0	30.0	
Total Split (%)	53.8%	53.8%		53.8%	53.8%	53.8%	46.2%	46.2%	46.2%	46.2%	46.2%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)		0.0			0.0	0.0		0.0	0.0		0.0	
Total Lost Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max		Max	Max	Max	None	None	None	None	None	
Act Effct Green (s)		31.1			31.1	31.1		13.3	13.3		13.3	
Actuated g/C Ratio		0.57			0.57	0.57		0.24	0.24		0.24	
v/c Ratio		0.67			0.50	0.18		0.54	0.40		0.35	
Control Delay		16.7			11.4	2.3		22.7	5.4		18.1	
Queue Delay		0.0			0.4	0.0		0.0	0.0		0.0	
Total Delay		16.7			11.8	2.3		22.7	5.4		18.1	
LOS		B			B	A		C	A		B	
Approach Delay		16.7			9.1			14.1			18.1	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		87			64	0		55	0		24	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		#299			181	25		104	37		57	
Internal Link Dist (ft)		105			94			73			330	
Turn Bay Length (ft)						100			100			
Base Capacity (vph)		704			784	881		705	751		555	
Starvation Cap Reductn		0			106	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		0.67			0.58	0.18		0.29	0.26		0.19	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 65			
Actuated Cycle Length: 54.5			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 13.4		Intersection LOS: B	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

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

Splits and Phases: 2: Memorial Plaza/Grant Street & Manville Road



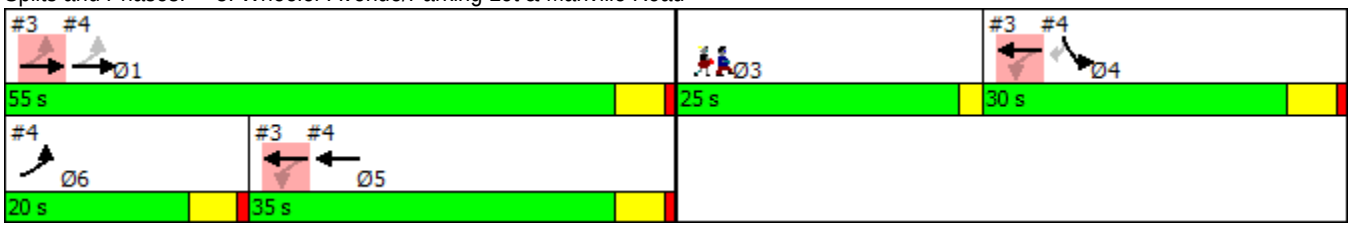
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	395	95	47	525	3	0	0	0	0	0	0
Future Volume (vph)	21	395	95	47	525	3	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	16	16	12	12	12	12	12	12	12
Storage Length (ft)	80		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.999							
Flt Protected	0.950				0.996							
Satd. Flow (prot)	1593	1845	0	0	1891	0	0	0	0	0	0	0
Flt Permitted	0.291				0.931							
Satd. Flow (perm)	488	1845	0	0	1767	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14										
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		151			119			129			120	
Travel Time (s)		3.4			2.7			2.9			2.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.77	0.77	0.77	0.95	0.95	0.95
Adj. Flow (vph)	22	416	100	49	553	3	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	516	0	0	605	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA							
Protected Phases		1			5 4							
Permitted Phases	1			5 4								
Detector Phase	1	1		5 4	5 4							
Switch Phase												
Minimum Initial (s)	5.0	5.0										
Minimum Split (s)	55.0	55.0										
Total Split (s)	55.0	55.0										
Total Split (%)	50.0%	50.0%										
Yellow Time (s)	4.0	4.0										
All-Red Time (s)	1.0	1.0										
Lost Time Adjust (s)	0.0	0.0										
Total Lost Time (s)	5.0	5.0										
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Max	Max										
Act Effct Green (s)	53.1	53.1			54.9							
Actuated g/C Ratio	0.62	0.62			0.64							
v/c Ratio	0.07	0.45			0.53							
Control Delay	15.9	15.6			6.6							
Queue Delay	0.0	3.6			0.3							
Total Delay	15.9	19.2			6.9							
LOS	B	B			A							
Approach Delay		19.0			6.9							
Approach LOS		B			A							
Queue Length 50th (ft)	2	63			19							

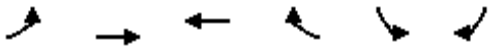
Lane Group	Ø3	Ø4	Ø5	Ø6
Lane Configurations				
Traffic Volume (vph)				
Future Volume (vph)				
Ideal Flow (vphpl)				
Lane Width (ft)				
Storage Length (ft)				
Storage Lanes				
Taper Length (ft)				
Lane Util. Factor				
Frt				
Flt Protected				
Satd. Flow (prot)				
Flt Permitted				
Satd. Flow (perm)				
Right Turn on Red				
Satd. Flow (RTOR)				
Link Speed (mph)				
Link Distance (ft)				
Travel Time (s)				
Peak Hour Factor				
Adj. Flow (vph)				
Shared Lane Traffic (%)				
Lane Group Flow (vph)				
Turn Type				
Protected Phases	3	4	5	6
Permitted Phases				
Detector Phase				
Switch Phase				
Minimum Initial (s)	5.0	2.0	2.0	2.0
Minimum Split (s)	25.0	9.0	9.0	9.0
Total Split (s)	25.0	30.0	35.0	20.0
Total Split (%)	23%	27%	32%	18%
Yellow Time (s)	2.0	4.0	4.0	4.0
All-Red Time (s)	0.0	1.0	1.0	1.0
Lost Time Adjust (s)				
Total Lost Time (s)				
Lead/Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	Max	None
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)				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	26	386			161							
Internal Link Dist (ft)		71			39			49			40	
Turn Bay Length (ft)	80											
Base Capacity (vph)	302	1150			1394							
Starvation Cap Reductn	0	527			285							
Spillback Cap Reductn	0	21			0							
Storage Cap Reductn	0	0			0							
Reduced v/c Ratio	0.07	0.83			0.55							

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 85.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 71.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Wheeler Avenue/Parking Lot & Manville Road





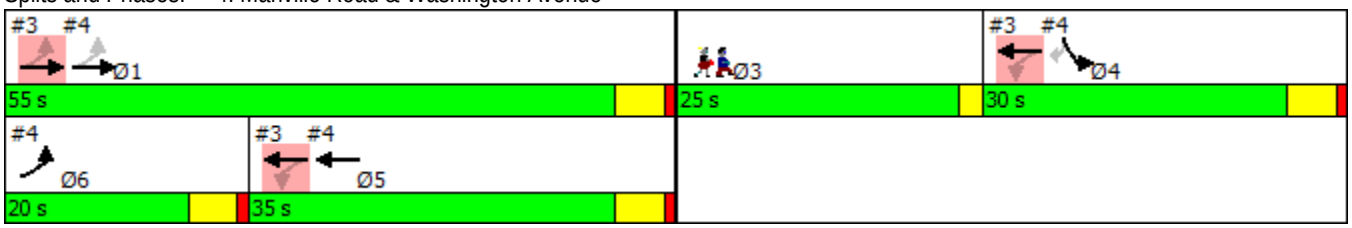
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	161	251	357	32	26	168	
Future Volume (vph)	161	251	357	32	26	168	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	16	12	12	12	12	
Storage Length (ft)	65			0	0	0	
Storage Lanes	1			0	1	1	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt			0.989			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1593	1882	1492	0	1406	1283	
Flt Permitted	0.307				0.950		
Satd. Flow (perm)	515	1882	1492	0	1406	1283	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			4			198	
Link Speed (mph)		30	30		30		
Link Distance (ft)		119	231		238		
Travel Time (s)		2.7	5.3		5.4		
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	
Parking (#/hr)			0	0	0	0	
Adj. Flow (vph)	189	295	420	38	31	198	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	189	295	458	0	31	198	
Turn Type	pm+pt	NA	NA		Prot	Perm	
Protected Phases	6	1	5		4		3
Permitted Phases	1					4	
Detector Phase	6	1	5		4	4	
Switch Phase							
Minimum Initial (s)	2.0	5.0	2.0		2.0	2.0	5.0
Minimum Split (s)	9.0	55.0	9.0		9.0	9.0	25.0
Total Split (s)	20.0	55.0	35.0		30.0	30.0	25.0
Total Split (%)	18.2%	50.0%	31.8%		27.3%	27.3%	23%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	2.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0		5.0	5.0	
Lead/Lag	Lead		Lag		Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes
Recall Mode	None	Max	Max		None	None	None
Act Effct Green (s)	53.1	53.1	37.5		13.6	13.6	
Actuated g/C Ratio	0.62	0.62	0.44		0.16	0.16	
v/c Ratio	0.42	0.25	0.70		0.14	0.54	
Control Delay	7.9	3.1	34.2		34.4	11.0	
Queue Delay	0.6	1.3	0.1		0.0	0.1	
Total Delay	8.5	4.4	34.3		34.4	11.1	
LOS	A	A	C		C	B	
Approach Delay		6.0	34.3		14.3		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Approach LOS		A	C		B		
Queue Length 50th (ft)	6	9	120		12	0	
Queue Length 95th (ft)	26	31	#539		42	49	
Internal Link Dist (ft)		39	151		158		
Turn Bay Length (ft)	65						
Base Capacity (vph)	520	1167	656		435	534	
Starvation Cap Reductn	116	658	0		0	0	
Spillback Cap Reductn	0	0	9		0	31	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.47	0.58	0.71		0.07	0.39	

Intersection Summary			
Area Type:	CBD		
Cycle Length: 110			
Actuated Cycle Length: 85.5			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 18.7		Intersection LOS: B	
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 4: Manville Road & Washington Avenue



Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	242	36	42	332	74	36
Future Vol, veh/h	242	36	42	332	74	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	7	2	2	6	2	2
Mvmt Flow	285	42	49	391	87	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	327	0	795	306
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	489	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1233	-	357	734
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	616	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1233	-	339	734
Mov Cap-2 Maneuver	-	-	-	-	339	-
Stage 1	-	-	-	-	747	-
Stage 2	-	-	-	-	585	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	17.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	411	-	-	1233	-
HCM Lane V/C Ratio	0.315	-	-	0.04	-
HCM Control Delay (s)	17.7	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	92	37	320	55	39	8	0	1943	61	0	1769	0
Future Volume (vph)	92	37	320	55	39	8	0	1943	61	0	1769	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.904			0.990				0.850			
Flt Protected		0.990			0.974							
Satd. Flow (prot)	0	1667	0	0	1796	0	0	3539	1583	0	3539	0
Flt Permitted		0.907			0.598							
Satd. Flow (perm)	0	1527	0	0	1103	0	0	3539	1583	0	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			5				95			
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		410			163			581			563	
Travel Time (s)		9.3			3.7			8.8			8.5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	96	39	333	57	41	8	0	2024	64	0	1843	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	468	0	0	106	0	0	2024	64	0	1843	0
Turn Type	Perm	NA		Perm	NA			NA	Free		NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4					Free			
Detector Phase	4	4		4	4			2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0			50.0			50.0	
Total Split (s)	30.0	30.0		30.0	30.0			50.0			50.0	
Total Split (%)	37.5%	37.5%		37.5%	37.5%			62.5%			62.5%	
Yellow Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0			1.0			1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None			Max			Max	
Act Effct Green (s)		25.0			25.0			45.0	80.0		45.0	
Actuated g/C Ratio		0.31			0.31			0.56	1.00		0.56	
v/c Ratio		0.97			0.30			1.02	0.04		0.93	
Control Delay		63.7			22.9			43.7	0.0		25.9	
Queue Delay		0.0			0.0			0.0	0.0		0.0	
Total Delay		63.7			22.9			43.7	0.0		25.9	
LOS		E			C			D	A		C	
Approach Delay		63.7			22.9			42.3			25.9	
Approach LOS		E			C			D			C	
Queue Length 50th (ft)		225			38			~521	0		408	
Queue Length 95th (ft)		#418			80			#707	0		#605	
Internal Link Dist (ft)		330			83			501			483	
Turn Bay Length (ft)												
Base Capacity (vph)		482			348			1990	1583		1990	

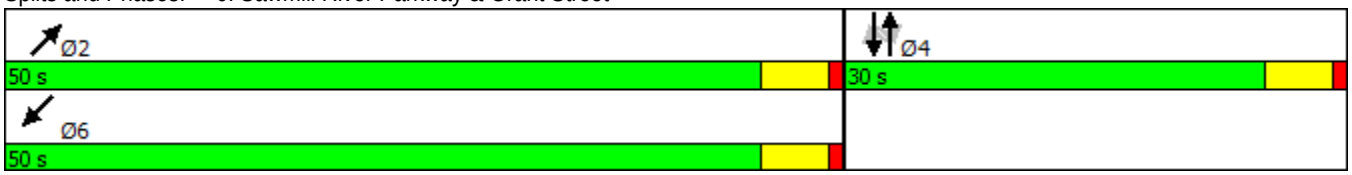
Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Starvation Cap Reductn		0			0			0	0		0	
Spillback Cap Reductn		0			0			0	0		0	
Storage Cap Reductn		0			0			0	0		0	
Reduced v/c Ratio		0.97			0.30			1.02	0.04		0.93	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 1.02			
Intersection Signal Delay: 37.4		Intersection LOS: D	
Intersection Capacity Utilization 89.5%		ICU Level of Service E	
Analysis Period (min) 15			

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

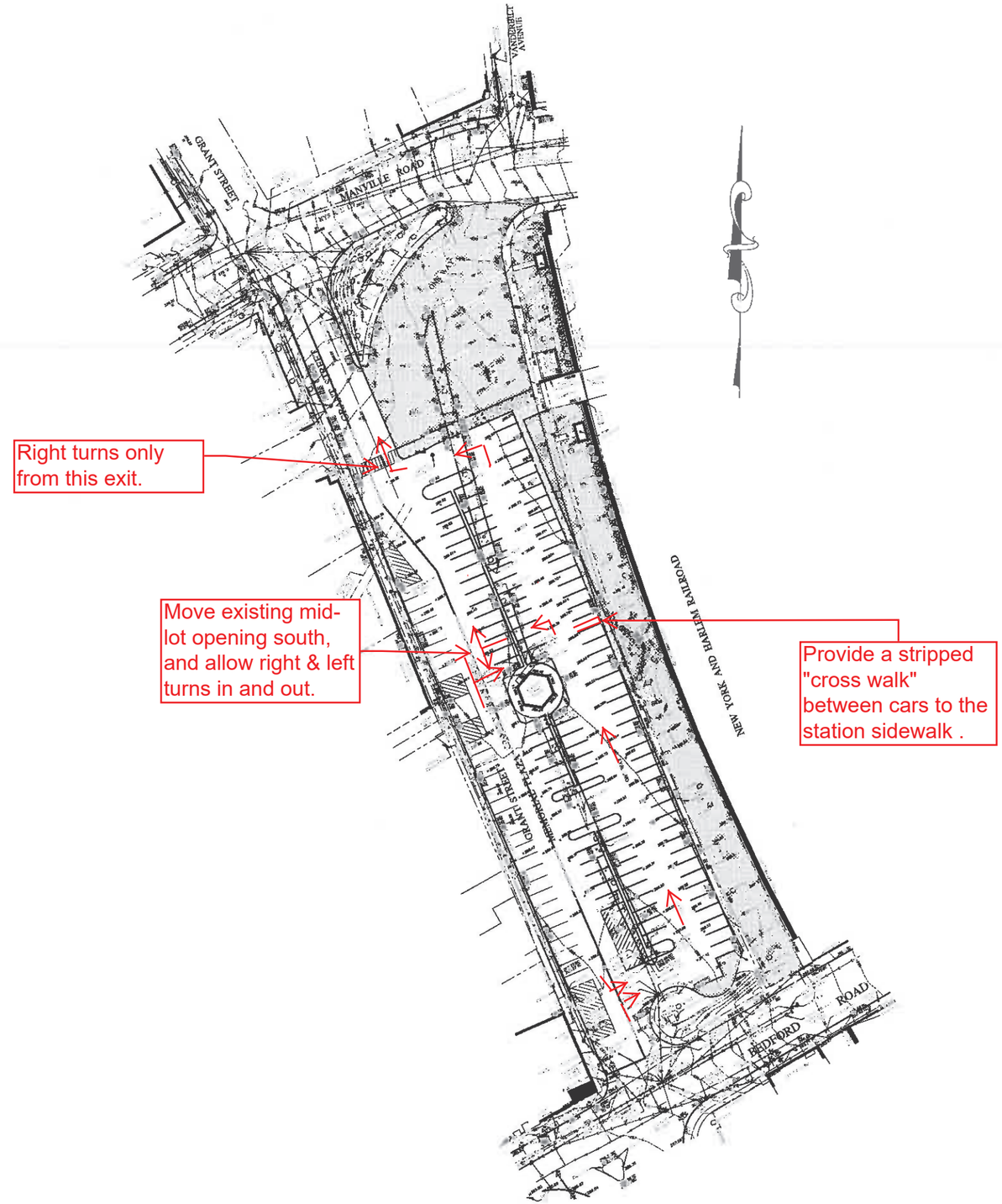
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Sawmill River Parkway & Grant Street



APPENDIX C

MEMORIAL PLAZA PARKING LOT



ALTERNATE #2

NUMBER OF PARKING SPACES: 132