



March 31, 2021

Stephanie Crampton
City of New Bedford
Department of Public Infrastructure
1105 Shawmut Avenue
New Bedford, MA 02746

Re: Response to Comments- Traffic Study Peer Review
Proposed Ascend Dispensary
115 Coggeshall Street
New Bedford, Massachusetts

Dear Ms. Crampton:

This letter will serve as a response to peer review comments received from the New Bedford Department of Public Infrastructure on March 17, 2021. The comments excerpted from the letter are reprinted in *italics* with our responses below.

Study Area Intersections:

1. *It is recommended that the following conditions be required of the proponent and included in the permit:*
 - *Deliveries will only occur during off-peak hours.*

The project proponent intends to limit deliveries to off-peak hours whenever possible

- *Delivery vehicles will not be allowed to back out into Coggeshall Street at any time.*

The project proponent will prohibit delivery vehicles from backing out onto Coggeshall Street.

108 Myrtle Street
Suite 502
Quincy, MA
02171
t 617.282.4675
800.286.2469
f 617.481.5885
www.fando.com

- *Delivery vehicles will be limited to 20' in length; alternatively, the proponent should provide a revised AutoTURN figure illustrating the turning movement of a 25' long vehicle*

We believe the submitted AutoTURN diagram depicting a shuttle van is the most suitable representation of a delivery van, and sufficiently captures the slight variability in van length.

- *A portion of the paved area in front of the site building should be maintained for use in delivery vehicle maneuvers to ensure that these vehicles will not back out into Coggeshall Street.*

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

Ms. Stephanie Crampton

March 31, 2021

Page 2

The area between the building and the sidewalk is approximately eight feet in width and if paved, would not serve as sufficient space for vehicle turning maneuvers.

- *The driveway apron should be enlarged to accommodate the delivery vehicle maneuvers as illustrated on the AutoTURN diagrams.*

The driveway apron extends four feet on either side of the driveway entrance as indicated on the submitted site plan. This is expected to sufficiently accommodate the delivery vehicle.

Traffic Volume and Counts:

2. *The project proponent has included information as requested regarding the local transit service available. Although not specifically identified in our previous review comment letter, the proponent should also identify the actual locations of the SRTA Route 2 and Route 11 bus stops nearest to the development and identify if existing access to the facility from those bus stops is currently accessible.*

Access to SRTA Route 2 and Route 11 are provided along the plaza's northern site driveway, north of the AFC Urgent Care. The bus stop provides a shelter and access to the site.

3. *The intersection of Belleville at Sawyer was counted on 3/4/2021 and 3/6/2021, but it appears that the volumes were treated as 2020 volumes in the volume calculation sheet. Please provide weekday seasonal and axle correction factors used.*

The volumes for the intersection of Belleville at Sawyer have been updated. Weekday seasonal and axle correction factors have also been provided.

Future Conditions:

4. *As per the previous document, the City of New Bedford requires 25 parking spaces, however per the revised plans submitted as part of the response to comments, there will be 15 spaces provided available per the agreement and 9 proposed new spaces, totaling 24 spaces. This discrepancy needs to be resolved.*

The building footprint has been finalized at less than 4,800 square feet, requiring only 24 parking spaces.

Ms. Stephanie Crampton

March 31, 2021

Page 3

Trip Distribution:

5. *The project proponent has redistributed the trip distribution associated with the development as requested. However, on 'Figure 3 – Trip Distribution' (Page 21 of the Response to Comments), between the intersections of Belleville Avenue at Coggeshall Street and Site Driveway at Coggeshall Street, the percentage of exiting volume changes from 50% to 60%. This discrepancy needs to be resolved to confirm the traffic entering the intersection of Belleville Avenue at Coggeshall Street.*

Figure 3 has been updated to accurately depict trip distributions.

6. *Consider including the intersection of Veterans Memorial Way at Site Driveway on 'Figure 3 – Trip Distribution' to improve clarity on where the vehicles are exiting and entering from.*

The site driveway has been added to all figures with volumes being shown on Figures 3, 4, and 5 to better show trip distribution.

7. *Sawyer Street needs to be labeled on Figures 1, 2, 4, and 5.*

Sawyer Street has been labeled.

Trip Generation:

8. *The project proponent collected trip generation data at an existing recreational dispensary in southern Massachusetts (the "Nature's Medicine" dispensary located in Fall River) as requested. It is our understanding that this dispensary began selling to recreational clients on February 16, 2021. Based on the data collected and as illustrated in the response to comments, the trip generation calculations prepared using the Trip Generation Manual are higher than those collected. Given the current traffic conditions that exist due to the pandemic, it is suggested that the project proponent be required to prepare a traffic monitoring report to document site traffic when conditions return to normal (anticipated to be fall 2021). In the event that trip generation rates far exceed those predicted, mitigation measures may be required.*

Noted. Traffic counts will be conducted under normal traffic conditions to observe any discrepancy between predicted and future normal trip generation. If trip generation rates exceed those predicted, mitigation may be considered at that time.

Ms. Stephanie Crampton

March 31, 2021

Page 4

Intersection Capacity Analysis and Queue Analysis:

9. *It is recommended that the project proponent be responsible for providing police officers to control traffic as needed during the opening of this new facility, and subsequently as required by the Department of Public Infrastructure (DPI).*

The applicant will provide police officers to control traffic as needed.

10. *It is recommended that the peak hour factor (PHF) be revised to 0.92 for future year traffic volumes in an urban environment in accordance with standard practice. It is also recommended that Table 3, Coggeshall Street at I-95 WB Exit 17 for the Saturday Peak Hour be revised accordingly - the results included in the Table do not match the Synchro Report.*

The peak hour factor has been revised to 0.92 for future year traffic volumes and Table 3 has been updated for all intersections and approaches.

Crash Analysis

11. *The proponent should confirm that when pulling crash data, the intersection limits extend to capture the back of the queue length. For example, the westbound intersection limits for the Acushnet Avenue at Coggeshall Street intersection should be approximately 355 feet.*

Crash data limits contain all queueing.

12. *It is recommended that 'Figure 1: Collision Diagram' (Page 30 of the Response to Comments) be reviewed/edited to ensure that all crashes are shown.*

Figure 1 has been updated to reflect all crashes at the intersection of Coggeshall Street and Acushnet Avenue.

13. *In the Crash Summary Table under "Type" there is a category for pedestrian/bicycle crashes which indicate that none occurred. The narrative indicates that four crashes involve a pedestrian.*

The Crash Summary Table has been updated to reflect the pedestrian crashes that occurred at the intersection of Belleville Avenue at Sawyer Street.



Ms. Stephanie Crampton
March 31, 2021
Page 5

Parking Analysis:

14. *The project proponent performed supplemental parking count data during a Saturday as requested and provided an estimate of the parking occupancy that might occur during non-pandemic conditions. While it appears that there will be sufficient surplus parking within the plaza available for patrons, if patrons attempt to park on-street in front of the building along Coggeshall Street, the proponent may be required to install "No Parking" signs to curtail this activity.*

Noted.

Attachments:

15. *Please label the tables on Page 51 and 52 (Dispensary Counts).*

Tables have been labeled.

16. *Please provide 2019 MassDOT weekday seasonal and axle correction factors backup.*

The 2019 MassDOT weekday seasonal and axle correction factors have been provided.

We trust that this information is sufficient for you to complete your review. Should you have any questions or require additional information, please contact us.

Sincerely,

A handwritten signature in black ink that reads "Katherine O'Shea".

Katherine O'Shea, EIT
Transportation Engineer

A handwritten signature in blue ink that reads "Matthew W. Skelly".

Matthew W. Skelly, PE, PTOE
Project Manager

Attachments: Volume Adjustment Calculations & Seasonal Adjustment Factors
 Updated Traffic Volume Figures
 Updated Capacity Analysis
 Updated Collision Diagram
 Updated Crash Data Summary Table
 Dispensary Counts
 Updated Synchro Reports



Coggeshall and Veterans Memorial Way

	Veterans Memorial Way From North			Coggeshall St From East			Route 195 From South			Coggeshall St From West		
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2020 PM Peak	142	158	54	267	204	116	178	164	41	91	396	203
Covid Adj.	147	164	56	276	211	120	184	170	42	94	410	210
Seasonal Adj. (1.04)	153	170	58	287	220	125	192	177	44	98	426	219
	154	171	58	289	221	125	193	177	44	98	428	220
	154	172	59	290	222	126	194	178	45	99	431	221
Annual Growth	155	173	59	292	223	127	194	179	45	99	433	222
	156	173	59	293	224	127	195	180	45	100	435	223
	157	174	60	295	225	128	196	181	45	100	437	224
	157	175	60	296	226	129	197	182	45	101	439	225
2027 No-Build PM Peak	158	176	60	298	227	129	198	183	46	101	441	226
2020 Sat Peak	141	132	61	231	155	109	88	91	25	82	287	175
Covid Adj.	146	137	63	239	160	113	91	94	26	85	297	181
Seasonal Adj.	152	142	66	249	167	117	95	98	27	88	309	188
	153	143	66	250	168	118	95	98	27	89	310	189
	153	144	66	251	169	119	96	99	27	89	312	190
Annual Growth	154	144	67	252	169	119	96	99	27	90	314	191
	155	145	67	254	170	120	97	100	27	90	315	192
	156	146	67	255	171	120	97	100	28	90	317	193
	156	146	68	256	172	121	98	101	28	91	318	194
2027 No-Build Sat. Peak	157	147	68	257	173	121	98	101	28	91	320	195



Coggeshall and Site Driveway

	115 Coggeshall Street Driveway		Coggeshall St From East		Coggeshall St From West	
Start Time	Left	Right	Thru	Right	Left	Thru
2020 PM Peak	7	54	418	16	53	688
Covid Adj.	7	56	433	17	55	712
Seasonal Adj. (1.04)	8	58	450	17	57	741
	8	58	452	17	57	744
	8	59	454	17	58	748
Annual Growth	8	59	457	17	58	752
	8	59	459	18	58	755
	8	60	461	18	58	759
	8	60	464	18	59	763
2027 No-Build PM Peak	8	60	466	18	59	767
2020 Sat Peak	16	47	297	14	62	500
Covid Adj.	17	49	307	14	64	518
Seasonal Adj.	17	51	320	15	67	538
	17	51	321	15	67	541
	17	51	323	15	67	544
Annual Growth	17	51	325	15	68	546
	18	52	326	15	68	549
	18	52	328	15	68	552
	18	52	329	16	69	555
2027 No-Build Sat. Peak	18	52	331	16	69	557



Coggeshall and Belleville

Start Time	Belleville Ave from North			Coggeshall St from East			Belleville Ave from South			Coggeshall St from West		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2020 PM Peak	143	127	132	131	340	92	47	188	419	85	336	41
Covid Adj.	148	131	137	136	352	95	49	195	434	88	348	42
Seasonal Adj. (1.04)	154	137	142	141	366	99	51	202	451	91	362	44
	155	137	143	142	368	100	51	203	453	92	363	44
	155	138	144	142	370	100	51	204	456	92	365	45
Annual Growth	156	139	144	143	371	101	51	205	458	93	367	45
	157	139	145	144	373	101	52	206	460	93	369	45
	158	140	146	145	375	102	52	207	462	94	371	45
	159	141	146	145	377	102	52	209	465	94	373	45
2027 No-Build PM Peak	159	142	147	146	379	103	52	210	467	95	375	46
2020 Sat Peak	130	103	110	107	285	55	39	130	308	58	267	59
Covid Adj.	135	107	114	111	295	57	40	135	319	60	276	61
Seasonal Adj.	140	111	118	115	307	59	42	140	332	62	287	64
	141	111	119	116	308	59	42	141	333	63	289	64
Annual Growth	141	112	120	116	310	60	42	141	335	63	290	64
	142	113	120	117	311	60	43	142	337	63	292	64
	143	113	121	117	313	60	43	143	338	64	293	65
	143	114	121	118	315	61	43	143	340	64	295	65
	144	114	122	119	316	61	43	144	342	64	296	65
2027 No-Build Sat. Peak	145	115	123	119	318	61	43	145	343	65	298	66



Coggeshall and Acushnet

Start Time	Coggeshall St from East			Acushnet Ave from South			Coggeshall St from West		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2020 PM Peak	0	368	79	121	377	238	51	266	0
Covid Adj.	0	381	82	125	390	246	53	275	0
Seasonal Adj. (1.0 - Acushnet Ave., 1.04 - Coggeshall St.)	0	396	85	125	390	246	55	286	0
	0	398	85	126	392	248	55	288	0
	0	400	86	126	394	249	55	289	0
Annual Growth	0	402	86	127	396	250	56	291	0
	0	404	87	128	398	251	56	292	0
	0	406	87	128	400	253	56	294	0
	0	408	88	129	402	254	57	295	0
	2027 No-Build PM Peak	0	410	88	130	404	255	57	296
2020 Sat Peak	0	317	67	96	276	166	64	222	0
Covid Adj.	0	328	69	99	286	172	66	230	0
Seasonal Adj.	0	341	72	99	286	172	69	239	0
	0	343	72	100	287	173	69	240	0
Annual Growth	0	345	73	100	289	174	70	241	0
	0	346	73	101	290	174	70	243	0
	0	348	74	101	291	175	70	244	0
	0	350	74	102	293	176	71	245	0
	0	352	74	102	294	177	71	246	0
2027 No-Build Sat. Peak	0	353	75	103	296	178	71	247	0



Coggeshall and Ashley

Start Time	Ashley Blvd from North			Coggeshall St from East			Coggeshall St from West		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2020 PM Peak	68	561	31	208	281	0	0	245	105
Covid Adj.	70	581	32	215	291	0	0	254	109
Season Adj. (1.0 - Ashley Blvd., 1.04 - Coggeshall St.)	70	581	32	224	302	0	0	264	113
	71	584	32	225	304	0	0	265	114
	71	586	32	226	306	0	0	266	114
Annual Growth	71	589	33	227	307	0	0	268	115
	72	592	33	228	309	0	0	269	115
	72	595	33	230	310	0	0	270	116
	73	598	33	231	312	0	0	272	116
2027 No-Build PM Peak	73	601	33	232	313	0	0	273	117
2020 Sat Peak	86	450	29	188	204	0	0	191	61
Covid Adj.	89	466	30	195	211	0	0	198	63
Seasonal Adj.	89	466	30	202	220	0	0	206	66
	89	468	30	203	221	0	0	207	66
	90	470	30	204	222	0	0	208	66
Annual Growth	90	473	30	205	223	0	0	209	67
	91	475	31	206	224	0	0	210	67
	91	478	31	207	225	0	0	211	67
	92	480	31	209	226	0	0	212	68
2027 No-Build Sat. Peak	92	482	31	210	227	0	0	213	68



Belleville and Sawyer

Start Time	Belleville Ave from North			Sawyer St from East			Belleville Ave from South			Sawyer St from West		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2021 PM Peak	195	363	41	14	105	284	22	329	17	39	119	46
Covid Adj.	202	376	42	14	109	294	23	341	18	40	123	48
Seasonal Adj. (0.95)	192	357	40	14	103	279	22	323	17	38	117	45
	193	359	41	14	104	281	22	325	17	39	118	45
	194	360	41	14	104	282	22	327	17	39	118	46
Annual Growth	195	362	41	14	105	283	22	328	17	39	119	46
	196	364	41	14	105	285	22	330	17	39	119	46
	197	366	41	14	106	286	22	332	17	39	120	46
2027 No-Build PM Peak	198	368	42	14	106	288	22	333	17	40	121	47
2021 Sat Peak	238	325	71	9	98	234	18	267	15	21	112	50
Covid Adj.	246	336	73	9	101	242	19	276	16	22	116	52
Seasonal Adj.	234	320	70	9	96	230	18	263	15	21	110	49
	235	321	70	9	97	231	18	264	15	21	111	49
	236	323	71	9	97	232	18	265	15	21	111	50
Annual Growth	238	324	71	9	98	234	18	266	15	21	112	50
	239	326	71	9	98	235	18	268	15	21	112	50
	240	328	72	9	99	236	18	269	15	21	113	50
2027 No-Build Sat. Peak	241	329	72	9	99	237	18	271	15	21	113	51

Massachusetts Highway Department
Statewide Traffic Data Collection
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

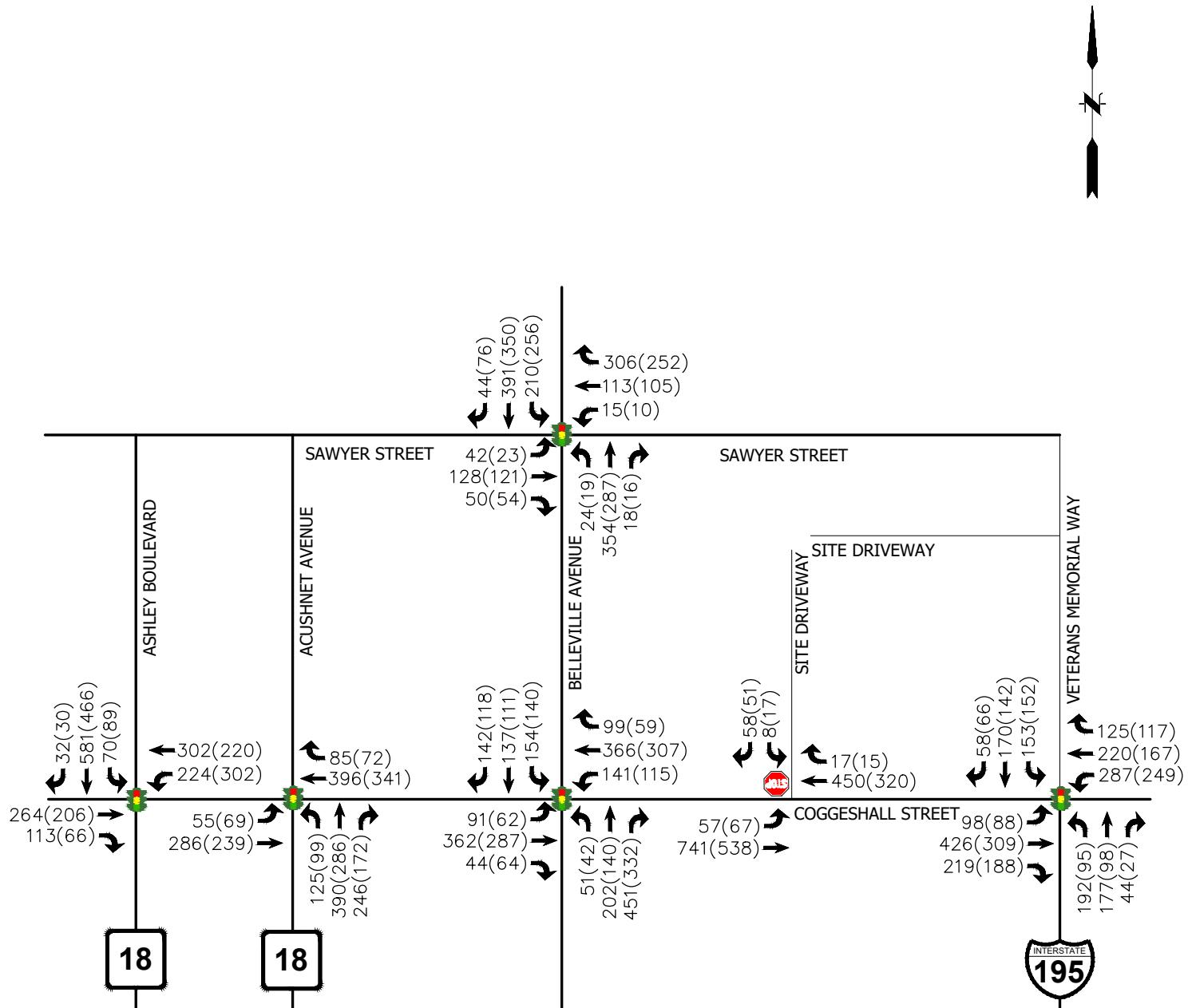
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations

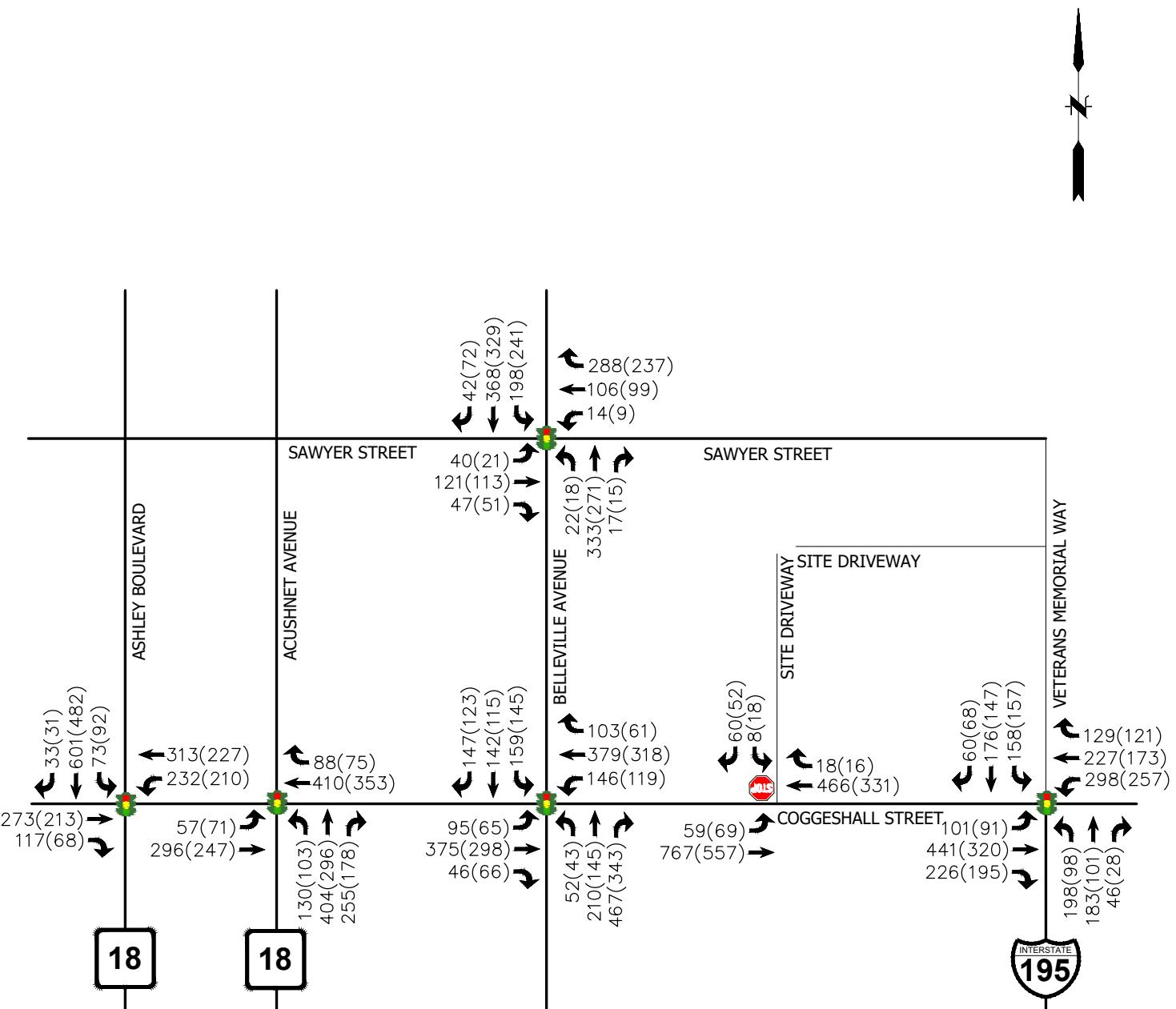
7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations

1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.



XXX(XXX) = WEEKDAY PM PEAK (SATURDAY MIDDAY PEAK)



XXX(XXX) = WEEKDAY PM PEAK (SATURDAY MIDDAY PEAK)



FUSS & O'NEILL

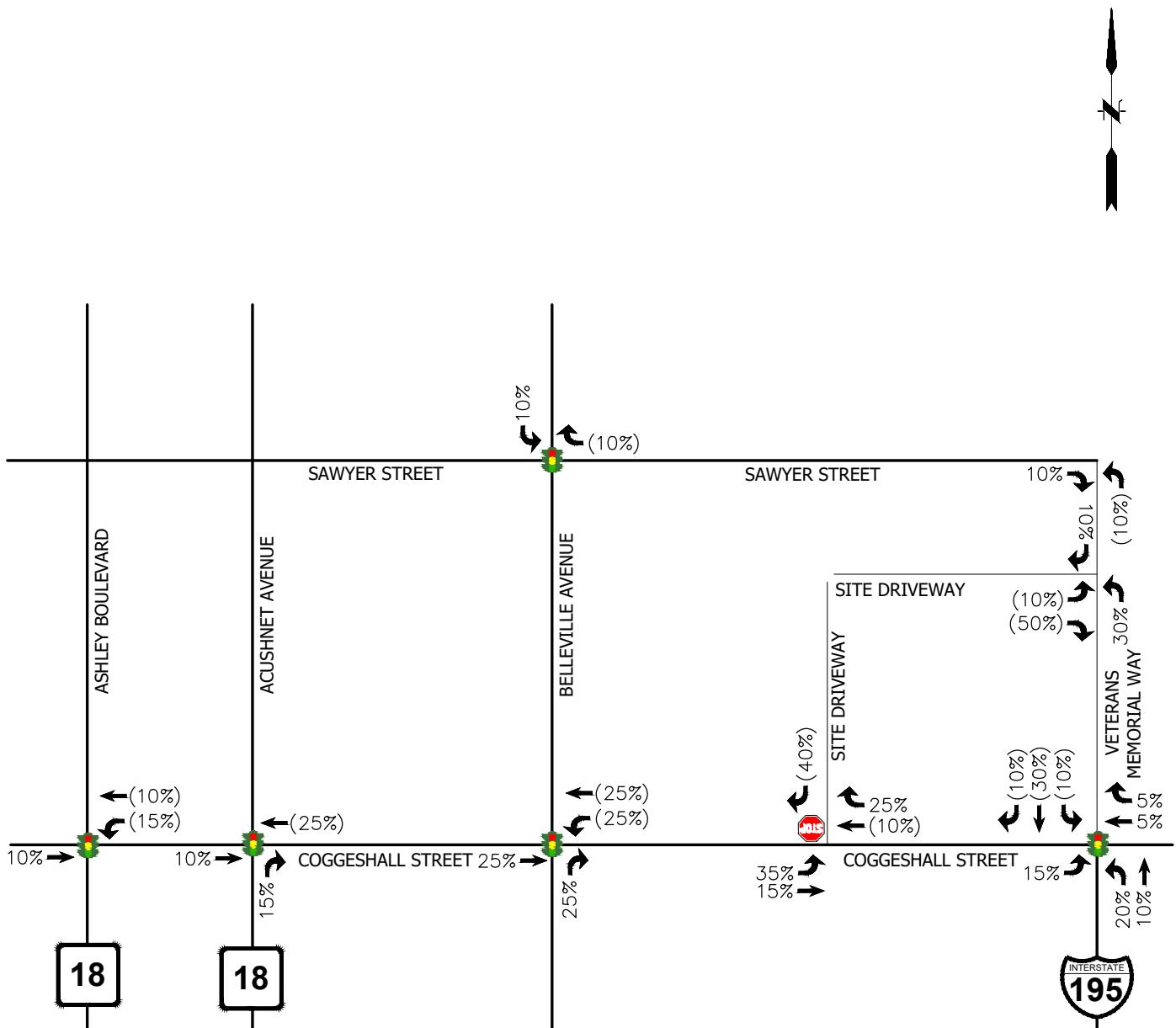
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

FIGURE 2 - 2027 NO-BUILD CONDITION

PROJ. NO: 20191061.T10

ASCEND MASS, LLC

MARCH 2021



XXX(XXX) = ENTERING TRAFFIC (EXITING TRAFFIC)



FUSS & O'NEILL
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

FIGURE 3 - TRIP DISTRIBUTION

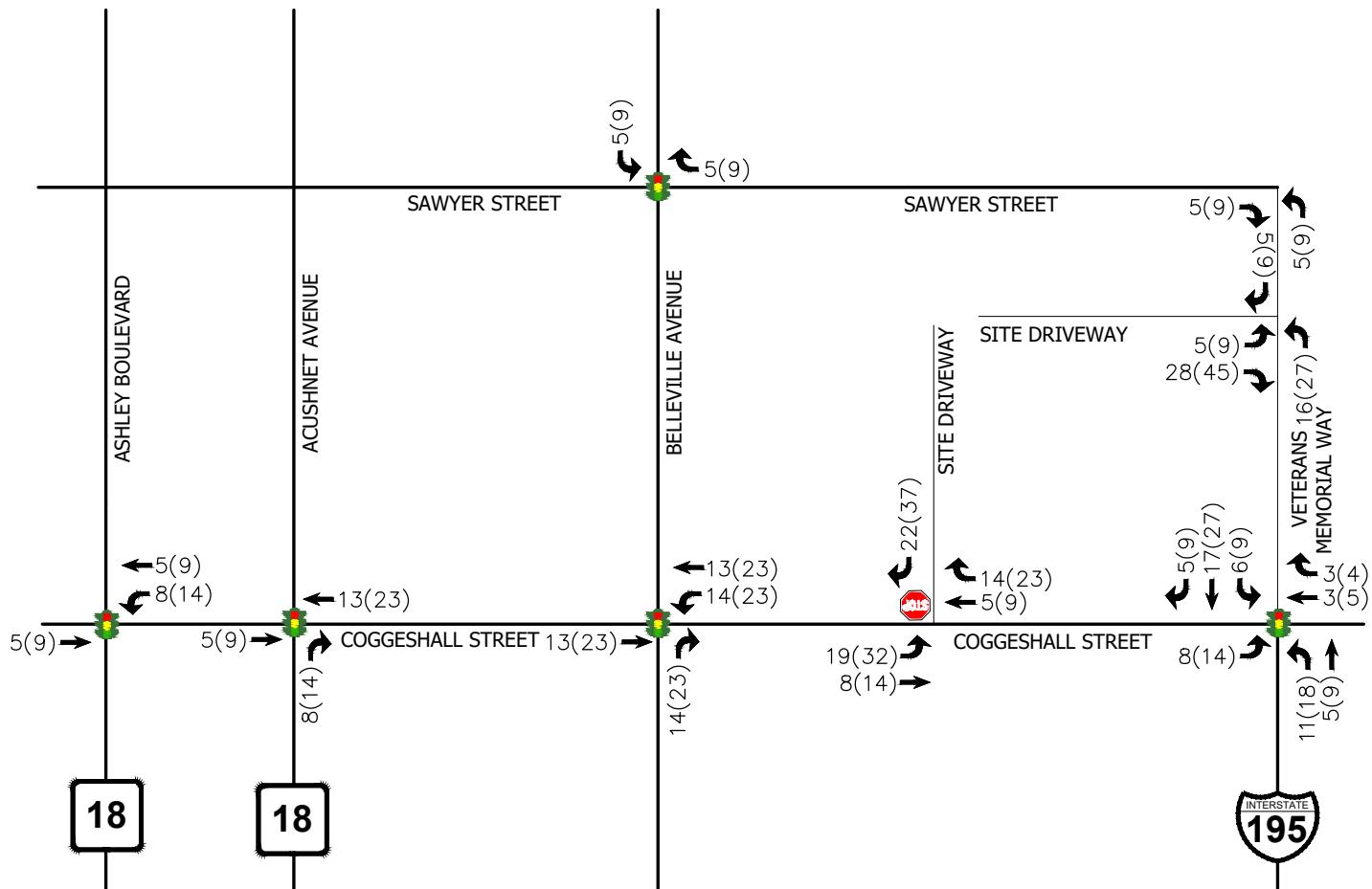
PROJ. NO: 20191061.T10

ASCEND MASS, LLC

MARCH 2021

SITE GENERATED TRAFFIC VOLUMES

	ENTER	EXIT	TOTAL
AFTERNOON	54	55	109
SATURDAY	91	91	182



XXX(XXX) = WEEKDAY PM PEAK (SATURDAY MIDDAY PEAK)



FUSS & O'NEILL

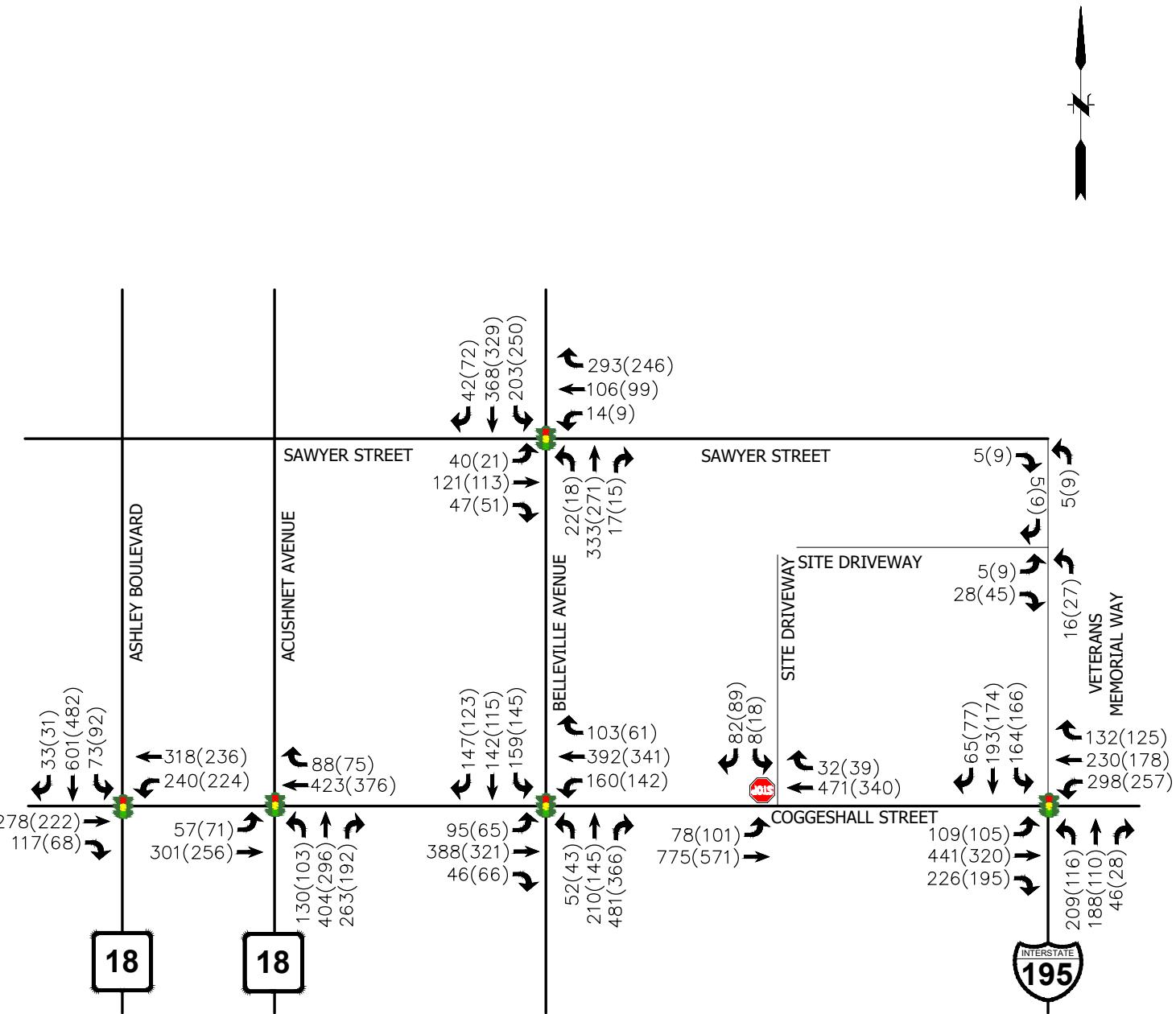
108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

FIGURE 4 - TRIP GENERATION

PROJ. NO: 20191061.T10

ASCEND MASS, LLC

MARCH 2021



XXX(XXX) = WEEKDAY PM PEAK (SATURDAY MIDDAY PEAK)



FUSS & O'NEILL

108 MYRTLE STREET, SUITE 502
QUINCY, MA 02171
617.282.4675
www.fando.com

FIGURE 5 - 2027 BUILD CONDITION

PROJ. NO: 20191061.T10

ASCEND MASS, LLC

MARCH 2021

Table 2—Unsignalized Intersection Critical Movement Delay per Vehicle

Critical Movement	Afternoon Peak Hour		Saturday Peak Hour	
	No-Build	Build	No-Build	Build
Coggeshall St. at Site Driveway				
Eastbound Left Turn	8.7 sec	8.8 sec	8.3 sec	8.5 sec
Southbound Approach	12.3 sec	16.4 sec	10.8 sec	11.4 sec

Table 3—Signalized Intersection LOS/Average Delay per Vehicle

Intersection/Approach	Afternoon Peak Hour		Saturday Peak Hour	
	No-Build	Build	No-Build	Build
Coggeshall St. at I-195 WB Exit 17 Ramps/Veterans Memorial Way	LOS C	LOS C	LOS C	LOS C
Eastbound Approach	21.3 sec	21.2 sec	14.7 sec	15.4 sec
Westbound Approach	15.9 sec	16.0 sec	11.5 sec	12.4 sec
Northbound Approach	35.2 sec	37.3 sec	31.6 sec	31.1 sec
Southbound Approach	54.3 sec*	61.5 sec*	37.4 sec	42.0 sec
Coggeshall St. at Belleville Ave.	LOS D	LOS D	LOS C	LOS C
Eastbound Approach	64.6 sec*	74.8 sec*	42.0 sec	51.5 sec
Westbound Approach	30.0 sec	30.3 sec	25.1 sec	25.9 sec
Northbound Approach	65.6 sec*	68.4 sec*	29.6 sec	31.9 sec
Southbound Approach	17.9 sec	18.3 sec	16.0 sec	16.4 sec
Coggeshall St. at Acushnet Ave.	LOS C	LOS C	LOS C	LOS C
Eastbound Approach	20.9 sec	21.0 sec	19.3 sec	19.6 sec
Westbound Approach	20.3 sec	20.5 sec	19.7 sec	20.1 sec
Northbound Approach	28.8 sec	28.9 sec	25.0 sec	25.2 sec
Coggeshall St. at Ashley Blvd.	LOS C	LOS C	LOS B	LOS C
Eastbound Approach	12.6 sec	12.8 sec	9.6 sec	9.9 sec
Westbound Approach	3.3 sec	3.4 sec	2.8 sec	2.9 sec
Southbound Approach	35.5 sec	35.5 sec	37.0 sec	37.0 sec
Belleville Avenue at Sawyer Street	LOS C	LOS C	LOS C	LOS C
Eastbound Approach	35.9 sec	36.8 sec	34.4 sec	35.8 sec
Westbound Approach	35.9 sec	36.6 sec	38.7 sec	40.4 sec
Northbound Approach	22.6 sec	22.6 sec	20.3 sec	20.3 sec
Southbound Approach	28.4 sec	32.3 sec	19.2 sec	21.1 sec

*indicates approach operates at LOS E or worse

Table 4—Peak Hour Queue Length Summary*

Critical Movements	Afternoon Peak Hour		Saturday Peak Hour		Available Storage
	No-Build	Build	No-Build	Build	
Coggeshall St. at I-195 WB Exit 17 Ramps/ Veterans Memorial Way					
Eastbound Left Turn	45 ft	45 ft	40 ft	45 ft	150 ft
Eastbound Through	325 ft	325 ft	230 ft	230 ft	1,000 ft
Eastbound Right Turn	0 ft	0 ft	0 ft	0 ft	150 ft
Westbound Left Turn	125 ft	125 ft	105 ft	105 ft	375 ft
Westbound Through/Right Turn	210 ft	215 ft	165 ft	170 ft	-
Northbound Left Turn	170 ft	190 ft	80 ft	95 ft	350 ft
Northbound Through/Right Turn	105 ft	105 ft	55 ft	60 ft	350 ft
Southbound Left Turn	210 ft	215 ft	195 ft	205 ft	250 ft
Southbound Through	230 ft	260 ft	170 ft	210 ft	475 ft
Southbound Right Turn	25 ft	30 ft	30 ft	30 ft	175 ft
Coggeshall St. at Site Driveway					
Eastbound Left Turn	5 ft	5 ft	5 ft	5 ft	150 ft
Southbound Right Turn	10 ft	20 ft	5 ft	10 ft	50 ft
Coggeshall St. at Belleville Ave.					
Eastbound Left Turn	50 ft	50 ft	35 ft	35 ft	80 ft
Eastbound Through/Right Turn	400 ft	415 ft	325 ft	355 ft	900 ft
Westbound Left Turn	75 ft	80 ft	60 ft	70 ft	75 ft
Westbound Through	335 ft	350 ft	250 ft	275 ft	950 ft
Westbound Right Turn	15 ft	15 ft	0 ft	0 ft	225 ft
Northbound Left Turn/Through	260 ft	260 ft	170 ft	170 ft	-
Northbound Right Turn	215 ft	230 ft	90 ft	115 ft	100 ft
Southbound Left Turn	105 ft	105 ft	90 ft	90 ft	150 ft
Southbound Through/Right Turn	140 ft	140 ft	110 ft	110 ft	660 ft
Coggeshall St. at Acushnet Ave.					
Eastbound Left Turn	15 ft	15 ft	50 ft	50 ft	125 ft
Eastbound Through	200 ft	200 ft	140 ft	150 ft	375 ft
Westbound Through/Right Turn	365 ft	380 ft	305 ft	325 ft	450 ft
Northbound Left Turn	105 ft	100 ft	85 ft	85 ft	150 ft
Northbound Through	320 ft	320 ft	225 ft	225 ft	-
Northbound Right Turn	50 ft	55 ft	45 ft	45 ft	150 ft

Coggeshall St. at Ashley Blvd.					Available Storage
Eastbound Through	210 ft	215 ft	145 ft	150 ft	625 ft
Eastbound Right Turn	35 ft	40 ft	25 ft	25 ft	75 ft
Westbound Left Turn	155 ft	160 ft	130 ft	135 ft	150 ft
Westbound Through	225 ft	230 ft	140 ft	140 ft	400 ft
Southbound Left Turn	65 ft	65 ft	85 ft	85 ft	115 ft
Southbound Through/Right Turn	225 ft	225 ft	190 ft	190 ft	450 ft
Belleville Avenue at Sawyer Street					
Eastbound Approach	180 ft	180 ft	155 ft	160 ft	415 ft
Westbound Approach	255 ft	255 ft	215 ft	220 ft	-
Northbound Approach	235 ft	235 ft	170 ft	170 ft	650 ft
Southbound Approach	430 ft	450 ft	335 ft	355 ft	-

* Queue lengths reported have been rounded to the nearest five feet

Coggeshall Street and Acushnet Avenue

Crash ID	Crash Date	Crash Severity	Light Conditions	Manner of Collision
1	01/12/2018	Non-fatal injury	Daylight	Rear-end
2	01/26/2018	Property damage only	Dark - lighted roadway	Rear-end
3	03/11/2018	Property damage only	Dark - lighted roadway	Sideswipe, same direction
4	03/28/2018	Property damage only	Daylight	Angle
5	04/08/2018	Property damage only	Daylight	Rear-end
6	02/03/2018	Fatal injury	Dark - lighted roadway	Single vehicle crash
7	06/17/2018	Non-fatal injury	Daylight	Rear-end
8	06/29/2018	Property damage only	Daylight	Angle
9	09/12/2018	Property damage only	Daylight	Angle
10	09/24/2018	Non-fatal injury	Dark - lighted roadway	Angle
11	11/29/2018	Property damage only	Dark - lighted roadway	Angle
12	07/02/2019	Unknown	Daylight	Rear-end
13	07/07/2019	Property damage only	Daylight	Rear-end
14	08/03/2019	Non-fatal injury	Daylight	Rear-end
15	08/26/2019	Non-fatal injury	Daylight	Rear-end
16	12/03/2019	Property damage only	Daylight	Head-on
17	12/01/2019	Non-fatal injury	Daylight	Single vehicle crash
18	01/06/2020	Property damage only	Dark - lighted roadway	Front to Rear
19	01/24/2020	Non-fatal injury	Daylight	Rear-end
20	02/01/2020	Property damage only	Dark - lighted roadway	Rear-end
21	02/18/2020	Non-fatal injury	Dark - lighted roadway	Rear-end
22	04/01/2020	Property damage only	Daylight	Sideswipe, same direction
23	06/25/2020	Property damage only	Daylight	Rear-end
24	08/05/2020	Non-fatal injury	Dark - lighted roadway	Rear-end
25	08/19/2020	Property damage only	Dusk	Rear-end
26	09/09/2020	Non-fatal injury	Dark - lighted roadway	Angle
27	12/17/2020	Property damage only	Dark - lighted roadway	Rear-end

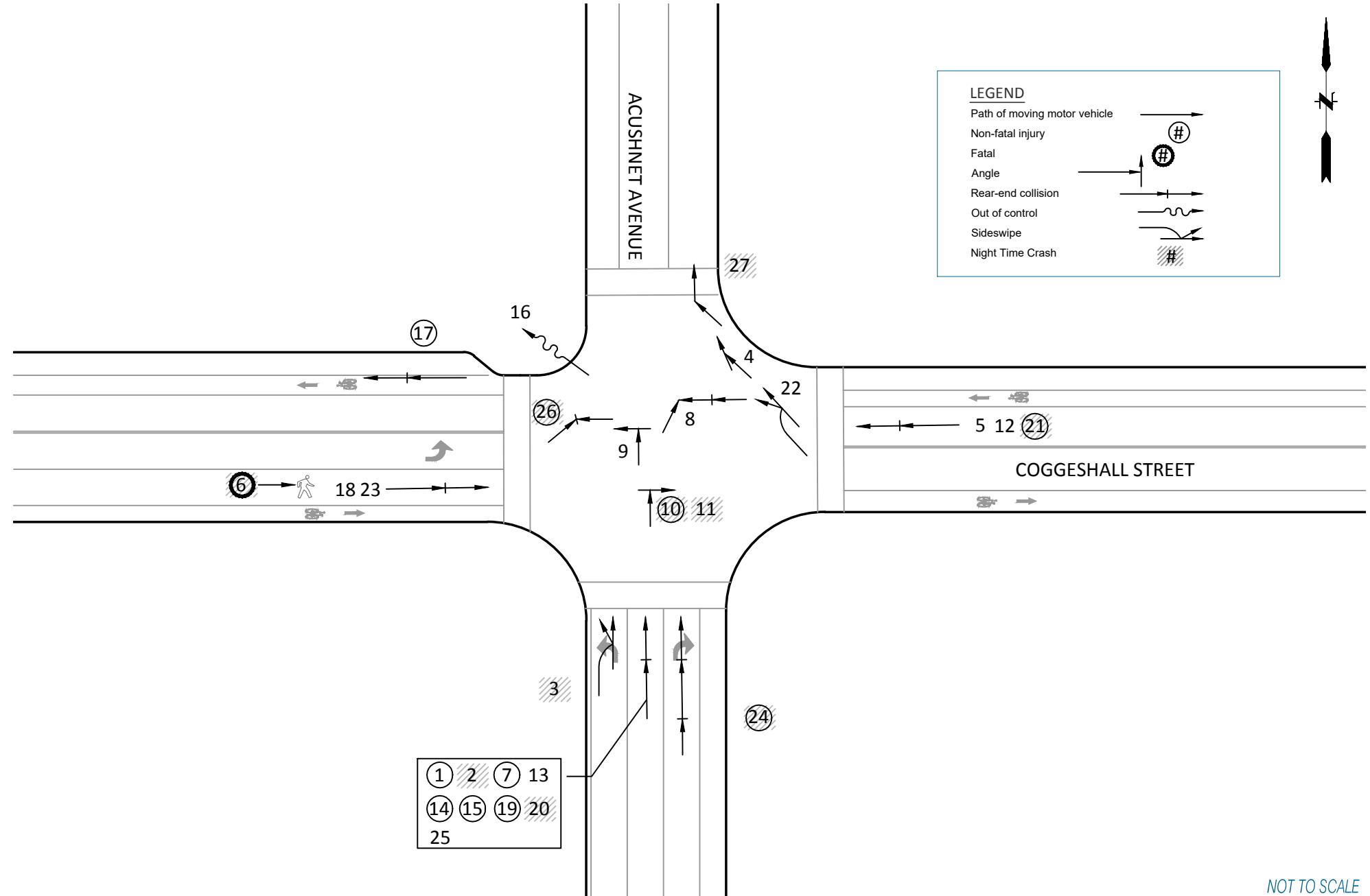


FIGURE 1: COLLISION DIAGRAM

INTERSECTION OF COGESHALL STREET AND ACUSHNET AVENUE
TIME PERIOD ANALYZED: JANUARY 01, 2018 - DECEMBER 31, 2020

Location: NEW BEDFORD, MA
Source: Police Crash Reports
Date Prepared: MARCH 2021
Prepared By: RNL

CRASH DATA SUMMARY - 2018 to 2020
STUDY AREA INTERSECTIONS

Criteria	Coggeshall Street at Veterans Memorial Way	Coggeshall Street at Belleville Avenue	Coggeshall Street at Acushnet Avenue	Coggeshall Street at Ashley Boulevard	Site Driveway	Belleville Avenue at Sawyer Street
YEAR						
2018	3	10	11	36	4	11
2019	8	5	6	10	3	12
<u>2020</u>	<u>8</u>	<u>11</u>	<u>10</u>	<u>16</u>	<u>4</u>	<u>11</u>
Total	19	26	27	62	11	34
Average No. of Crashes	6.33	8.67	9.00	20.67	3.67	11.33
Crash Rate	0.72	0.95	1.40	2.23	0.56	1.81
TYPE						
Angle	6	10	6	33	8	10
Rear-End	6	10	16	10	2	10
Head-On	1	1	1	0	1	2
Sideswipe	0	1	2	12	0	4
Pedestrian/Bicycle	0	0	0	0	0	4
Collision w/ Fixed Object	5	4	2	6	0	3
<u>Unknown/Other</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>1</u>
Total	19	26	27	62	11	34
SEVERITY						
Property Damage Only	11	19	15	35	9	22
Non-fatal Injury	8	7	10	26	2	10
Fatality	0	0	1	0	0	0
<u>Unknown/Other</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>2</u>
Total	19	26	27	62	11	34
WEATHER						
Clear	16	24	19	50	9	24
Wet	2	2	3	6	1	8
Snow/Ice	0	0	3	2	0	0
Clouds	1	0	2	4	1	2
Fog	0	0	0	0	0	0
<u>Unknown/Other</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	19	26	27	62	11	34
TIME						
Weekday 7:30 AM - 9:30 AM	2	2	2	4	0	0
Weekday 3:30 PM - 5:30 PM	2	4	4	10	2	7
<u>Other</u>	<u>15</u>	<u>20</u>	<u>21</u>	<u>48</u>	<u>9</u>	<u>27</u>
Total	19	26	27	62	11	34

District #5 Average Crash Rates: 0.75 Signalized Intersections
0.57 Unsigned Intersections

Lanes, Volumes, Timings

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

2027 PM No Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	101	441	226	298	227	129	198	183	46	158	176	60
Future Volume (vph)	101	441	226	298	227	129	198	183	46	158	176	60
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	0.95	1.00	1.00	1.00
Frt				0.850		0.946			0.970			0.850
Flt Protected	0.950				0.950			0.950			0.950	
Satd. Flow (prot)	1770	1863	1583	1770	1762	0	1770	3433	0	1770	1863	1583
Flt Permitted	0.509				0.266			0.385			0.950	
Satd. Flow (perm)	948	1863	1583	495	1762	0	717	3433	0	1770	1863	1583
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)						37			28			73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			460			227			299	
Travel Time (s)		8.9			10.5			5.2			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	479	246	324	247	140	215	199	50	172	191	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	110	479	246	324	387	0	215	249	0	172	191	65
Turn Type	pm+pt	NA	custom	pm+pt	NA		pm+pt	NA		Prot	NA	pt+ov
Protected Phases	5	2	2	1	6		3	8		7	4	4 5
Permitted Phases	2	1	3	4	5		8					
Detector Phase	5	2	2	1	6		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	22.5	22.5	10.5	22.5		10.5	10.5		10.5	10.5	
Total Split (s)	20.0	40.0	40.0	20.0	40.0		15.0	15.0		15.0	15.0	
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%		16.7%	16.7%		16.7%	16.7%	
Maximum Green (s)	15.5	35.5	35.5	15.5	35.5		10.5	10.5		10.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	None		None	None	
Act Effct Green (s)	43.3	35.5	87.1	52.8	42.8		20.7	10.4		10.4	10.5	22.8
Actuated g/C Ratio	0.50	0.41	1.00	0.61	0.49		0.24	0.12		0.12	0.12	0.26
v/c Ratio	0.20	0.63	0.16	0.67	0.44		0.73	0.57		0.82	0.85	0.14
Control Delay	8.8	25.7	0.2	15.4	15.8		42.7	38.3		68.8	71.7	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.8	25.7	0.2	15.4	15.8		42.7	38.3		68.8	71.7	6.4
LOS	A	C	A	B	B		D	D		E	E	A
Approach Delay			16.0			15.6			40.3			60.6
Approach LOS			B			B			D			E
Queue Length 50th (ft)	23	207	0	79	125		96	61		94	105	0
Queue Length 95th (ft)	44	325	0	123	209		#171	103		#208	#231	26
Internal Link Dist (ft)			310			380			147			219

Lanes, Volumes, Timings

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

2027 PM No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	697	759	1583	527	884		299	438		213	224	602
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.16	0.63	0.16	0.61	0.44		0.72	0.57		0.81	0.85	0.11

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 28.3

Intersection LOS: C

Intersection Capacity Utilization 75.0%

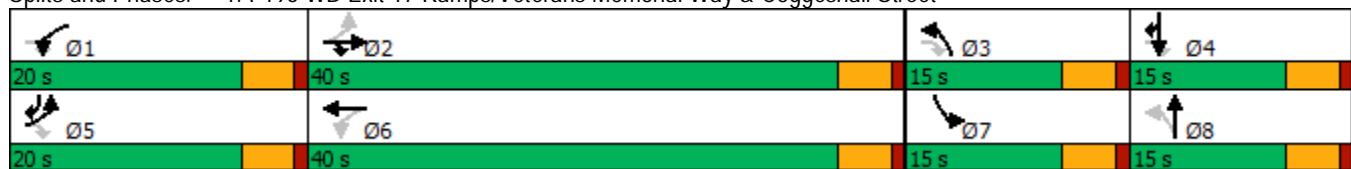
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street



HCM 6th Signalized Intersection Summary

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

2027 PM No Build Condition



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	101	441	226	298	227	129	198	183	46	158	176	60
Future Volume (veh/h)	101	441	226	298	227	129	198	183	46	158	176	60
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No											
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	479	0	324	247	140	215	199	50	172	191	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	530	778		508	536	304	329	367	90	207	230	298
Arrive On Green	0.07	0.42	0.00	0.13	0.48	0.48	0.12	0.13	0.13	0.12	0.12	0.12
Sat Flow, veh/h	1781	1870	1585	1781	1121	635	1781	2828	694	1781	1870	1585
Grp Volume(v), veh/h	110	479	0	324	0	387	215	123	126	172	191	65
Grp Sat Flow(s), veh/h/ln	1781	1870	1585	1781	0	1756	1781	1777	1745	1781	1870	1585
Q Serve(g_s), s	2.9	17.2	0.0	8.2	0.0	12.6	8.8	5.5	5.8	8.1	8.5	3.0
Cycle Q Clear(g_c), s	2.9	17.2	0.0	8.2	0.0	12.6	8.8	5.5	5.8	8.1	8.5	3.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	530	778		508	0	840	329	231	226	207	230	298
V/C Ratio(X)	0.21	0.62		0.64	0.00	0.46	0.65	0.53	0.56	0.83	0.83	0.22
Avail Cap(c_a), veh/h	737	778		604	0	840	329	231	226	219	230	298
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.6	19.6	0.0	13.1	0.0	14.9	28.1	34.7	34.8	36.9	36.6	29.3
Incr Delay (d2), s/veh	0.2	3.6	0.0	1.7	0.0	1.8	4.5	2.4	3.0	22.0	21.9	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.1	7.8	0.0	3.1	0.0	5.1	4.1	2.5	2.6	4.7	5.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	12.8	23.2	0.0	14.8	0.0	16.7	32.7	37.1	37.8	58.9	58.4	29.7
LnGrp LOS	B	C		B	A	B	C	D	D	E	E	C
Approach Vol, veh/h		589	A		711			464			428	
Approach Delay, s/veh		21.3			15.9			35.2			54.3	
Approach LOS		C			B			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.4	40.0	15.0	15.0	10.1	45.3	14.4	15.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	15.5	35.5	10.5	10.5	15.5	35.5	10.5	10.5				
Max Q Clear Time (g_c+l1), s	10.2	19.2	10.8	10.5	4.9	14.6	10.1	7.8				
Green Ext Time (p_c), s	0.7	3.9	0.0	0.0	0.5	1.7	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay 28.9

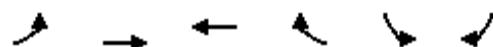
HCM 6th LOS C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings
2: Coggeshall Street & Site Driveway

Coggeshall Street
2027 PM No Build Condition



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	
Traffic Volume (vph)	59	767	466	18	8	60
Future Volume (vph)	59	767	466	18	8	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.995			0.865
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1853	0	0	1611
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1853	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		705	390		266	
Travel Time (s)		16.0	8.9		6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	834	507	20	9	65
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	834	527	0	9	65
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↗	
Traffic Vol, veh/h	59	767	466	18	8	60
Future Vol, veh/h	59	767	466	18	8	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	64	834	507	20	9	65

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	527	0	-	0	1479	517
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	962	-
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	1040	-	-	-	138	558
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	371	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1040	-	-	-	129	558
Mov Cap-2 Maneuver	-	-	-	-	129	-
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	371	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1040	-	-	-	558
HCM Lane V/C Ratio	0.062	-	-	-	0.117
HCM Control Delay (s)	8.7	-	-	-	12.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Lanes, Volumes, Timings
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 PM No Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑	↑	↑	↑	↑	↓	
Traffic Volume (vph)	95	375	46	146	379	103	52	210	467	159	142	147
Future Volume (vph)	95	375	46	146	379	103	52	210	467	159	142	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	130		215	0		0	125		0
Storage Lanes	1		0	1		1	0		1	1		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		0.984				0.850			0.850		0.924	
Flt Protected	0.950			0.950				0.990		0.950		
Satd. Flow (prot)	1770	1833	0	1770	1863	1583	0	1844	1583	1770	1721	0
Flt Permitted	0.349			0.197				0.846		0.257		
Satd. Flow (perm)	650	1833	0	367	1863	1583	0	1576	1583	479	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				145			162		82	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1007			705			228			695	
Travel Time (s)		22.9			16.0			5.2			15.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	408	50	159	412	112	57	228	508	173	154	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	458	0	159	412	112	0	285	508	173	314	0
Turn Type	pm+pt	NA		pm+pt	NA	pt+ov	Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	5	2		1	6	6 7		8	1	7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6	6 7	8	8	1	7	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.5	15.5		12.0	16.0		12.0	12.0	12.0	12.5	12.5	
Total Split (s)	22.0	22.0		17.0	17.0		20.0	20.0	17.0	12.5	32.5	
Total Split (%)	30.8%	30.8%		23.8%	23.8%		28.0%	28.0%	23.8%	17.5%	45.5%	
Maximum Green (s)	16.5	16.5		11.0	11.0		14.0	14.0	11.0	6.0	26.0	
Yellow Time (s)	3.0	3.0		3.5	3.0		3.5	3.5	3.5	3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	3.0		2.5	2.5	2.5	3.5	3.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0			6.0	6.0	6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	None	None	None	None	
Act Effct Green (s)	24.4	16.5		28.3	20.3	32.8		14.0	29.3	26.0	26.0	
Actuated g/C Ratio	0.35	0.24		0.41	0.29	0.47		0.20	0.42	0.37	0.37	
v/c Ratio	0.29	1.04		0.47	0.76	0.14		0.90	0.67	0.60	0.45	
Control Delay	13.7	84.4		16.9	36.2	1.9		62.3	15.9	26.0	14.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	13.7	84.4		16.9	36.2	1.9		62.3	15.9	26.0	14.8	
LOS	B	F		B	D	A		E	B	C	B	
Approach Delay		71.4			26.1			32.5			18.8	
Approach LOS		E			C			C			B	

Lanes, Volumes, Timings

Coggeshall Street

3: Belleville Avenue & Coggeshall Street

2027 PM No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	24	~221		39	168	0		123	112	52	72	
Queue Length 95th (ft)	50	#399		73	#336	17		#262	215	#103	141	
Internal Link Dist (ft)		927			625			148			615	
Turn Bay Length (ft)	110			130		215				125		
Base Capacity (vph)	559	439		373	541	821		316	793	289	692	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.18	1.04		0.43	0.76	0.14		0.90	0.64	0.60	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 71.5

Actuated Cycle Length: 69.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 36.8

Intersection LOS: D

Intersection Capacity Utilization 82.9%

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: 3: Belleville Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 PM No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘		↑ ↗	↑ ↘	↑ ↙	↑ ↖	↑ ↗	↑ ↘	↑ ↙	↑ ↖	
Traffic Volume (veh/h)	95	375	46	146	379	103	52	210	467	159	142	147
Future Volume (veh/h)	95	375	46	146	379	103	52	210	467	159	142	147
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	408	50	159	412	112	57	228	508	173	154	160
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	398	49	271	501	565	114	298	474	298	328	341
Arrive On Green	0.08	0.24	0.24	0.09	0.27	0.27	0.21	0.21	0.21	0.09	0.39	0.39
Sat Flow, veh/h	1781	1634	200	1781	1870	1585	243	1444	1585	1781	840	873
Grp Volume(v), veh/h	103	0	458	159	412	112	285	0	508	173	0	314
Grp Sat Flow(s), veh/h/ln	1781	0	1834	1781	1870	1585	1687	0	1585	1781	0	1713
Q Serve(g_s), s	2.8	0.0	16.5	4.4	14.0	3.3	7.3	0.0	14.0	4.9	0.0	9.3
Cycle Q Clear(g_c), s	2.8	0.0	16.5	4.4	14.0	3.3	10.8	0.0	14.0	4.9	0.0	9.3
Prop In Lane	1.00		0.11	1.00		1.00	0.20		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	295	0	447	271	501	565	412	0	474	298	0	670
V/C Ratio(X)	0.35	0.00	1.03	0.59	0.82	0.20	0.69	0.00	1.07	0.58	0.00	0.47
Avail Cap(c_a), veh/h	593	0	447	395	501	565	412	0	474	298	0	670
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	25.6	18.4	23.3	15.1	25.5	0.0	23.8	18.7	0.0	15.4
Incr Delay (d2), s/veh	0.7	0.0	49.3	2.0	14.2	0.8	4.9	0.0	61.6	2.8	0.0	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.1	0.0	12.8	1.8	7.7	1.2	4.7	0.0	15.1	2.1	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.7	0.0	74.9	20.4	37.5	15.9	30.3	0.0	85.4	21.5	0.0	15.9
LnGrp LOS	B	A	F	C	D	B	C	A	F	C	A	B
Approach Vol, veh/h												
Approach Delay, s/veh	561				683			793			487	
Approach LOS												
	64.6				30.0			65.6			17.9	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.3	22.5		33.0	10.6	24.1	12.5	20.5				
Change Period (Y+Rc), s	6.0	* 6		6.5	5.5	6.0	6.5	* 6.5				
Max Green Setting (Gmax), s	11.0	* 17		26.0	16.5	11.0	6.0	* 14				
Max Q Clear Time (g_c+l1), s	6.4	18.5		11.3	4.8	16.0	6.9	16.0				
Green Ext Time (p_c), s	0.2	0.0		1.1	0.2	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	46.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

2027 PM No Build Condition

	→	→	→	←	←	↑	↑	↑	↓	↓	←	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↑		↑	↑	↑			
Traffic Volume (vph)	57	296	0	0	410	88	130	404	255	0	0	0
Future Volume (vph)	57	296	0	0	410	88	130	404	255	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0	0	0
Storage Lanes	1		0	0		0	1		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
Fr _t					0.976				0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	1863	0	0	1818	0	1770	1863	1583	0	0	0
Flt Permitted	0.240						0.950					
Satd. Flow (perm)	447	1863	0	0	1818	0	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12				277			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		482			1007			248			274	
Travel Time (s)		11.0			22.9			5.6			6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	322	0	0	446	96	141	439	277	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	322	0	0	542	0	141	439	277	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Prot			
Protected Phases	5	2			6			8	8			
Permitted Phases	2						8					
Detector Phase	5	2			6		8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0	5.0			
Minimum Split (s)	9.5	22.5			22.5		22.5	22.5	22.5			
Total Split (s)	27.0	55.0			28.0		35.0	35.0	35.0			
Total Split (%)	30.0%	61.1%			31.1%		38.9%	38.9%	38.9%			
Maximum Green (s)	22.5	50.5			23.5		30.5	30.5	30.5			
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5			
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	0.0	0.0			
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max		Max	Max	Max			
Walk Time (s)		7.0			7.0		7.0	7.0	7.0			
Flash Dont Walk (s)	11.0			11.0		11.0	11.0	11.0	11.0			
Pedestrian Calls (#/hr)	0			0		0	0	0	0			
Act Effct Green (s)	50.5	50.5			41.1		30.5	30.5	30.5			
Actuated g/C Ratio	0.56	0.56			0.46		0.34	0.34	0.34			
v/c Ratio	0.18	0.31			0.65		0.24	0.70	0.39			
Control Delay	7.4	11.4			24.1		22.7	32.7	4.5			
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0			
Total Delay	7.4	11.4			24.1		22.7	32.7	4.5			

Lanes, Volumes, Timings

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

Coggeshall Street

2027 PM No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B			C		C	C	A			
Approach Delay		10.8			24.1				21.9			
Approach LOS			B		C			C				
Queue Length 50th (ft)	22	130			235		57	214	0			
Queue Length 95th (ft)	15	202			366		103	322	52			
Internal Link Dist (ft)		402			927				168			194
Turn Bay Length (ft)		150										
Base Capacity (vph)	581	1045			835		599	631	719			
Starvation Cap Reductn	0	0			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.11	0.31			0.65		0.24	0.70	0.39			

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 20.2

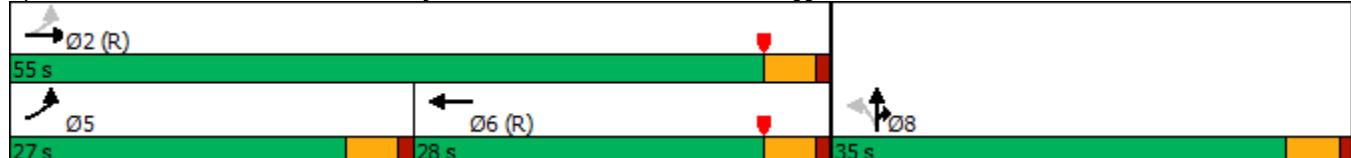
Intersection LOS: C

Intersection Capacity Utilization 63.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

2027 PM No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↔		↑	↑	↑	0	0	0
Traffic Volume (veh/h)	57	296	0	0	410	88	130	404	255	0	0	0
Future Volume (veh/h)	57	296	0	0	410	88	130	404	255	0	0	0
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	62	322	0	0	446	96	141	439	277			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	365	1049	0	0	697	150	604	634	537			
Arrive On Green	0.01	0.19	0.00	0.00	0.47	0.47	0.34	0.34	0.34			
Sat Flow, veh/h	1781	1870	0	0	1492	321	1781	1870	1585			
Grp Volume(v), veh/h	62	322	0	0	0	542	141	439	277			
Grp Sat Flow(s), veh/h/ln	1781	1870	0	0	0	1813	1781	1870	1585			
Q Serve(g_s), s	1.5	13.4	0.0	0.0	0.0	20.4	5.1	18.2	12.6			
Cycle Q Clear(g_c), s	1.5	13.4	0.0	0.0	0.0	20.4	5.1	18.2	12.6			
Prop In Lane	1.00		0.00	0.00		0.18	1.00		1.00			
Lane Grp Cap(c), veh/h	365	1049	0	0	0	847	604	634	537			
V/C Ratio(X)	0.17	0.31	0.00	0.00	0.00	0.64	0.23	0.69	0.52			
Avail Cap(c_a), veh/h	733	1049	0	0	0	847	604	634	537			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.96	0.96	0.00	0.00	0.00	0.56	1.00	1.00	1.00			
Uniform Delay (d), s/veh	13.6	21.5	0.0	0.0	0.0	18.2	21.4	25.7	23.8			
Incr Delay (d2), s/veh	0.2	0.7	0.0	0.0	0.0	2.1	0.9	6.1	3.5			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.6	6.8	0.0	0.0	0.0	8.6	2.2	8.9	5.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.8	22.3	0.0	0.0	0.0	20.3	22.3	31.8	27.3			
LnGrp LOS	B	C	A	A	A	C	C	C	C			
Approach Vol, veh/h		384			542			857				
Approach Delay, s/veh		20.9			20.3			28.8				
Approach LOS		C			C			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+R _c), s		55.0			8.4	46.6		35.0				
Change Period (Y+R _c), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			22.5	23.5		30.5				
Max Q Clear Time (g_c+l1), s		15.4			3.5	22.4		20.2				
Green Ext Time (p_c), s		1.3			0.1	0.3		2.8				
Intersection Summary												
HCM 6th Ctrl Delay		24.5										
HCM 6th LOS		C										

Lanes, Volumes, Timings

Coggeshall Street

5: Ashley Boulevard (Route 18) & Coggeshall Street

2027 PM No Build Condition

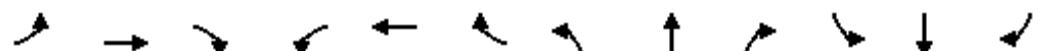
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑					↑	↑↑	
Traffic Volume (vph)	0	273	117	232	313	0	0	0	0	73	601	33
Future Volume (vph)	0	273	117	232	313	0	0	0	0	73	601	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0	0	0
Storage Lanes	0		1	1		0	0		0	1		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	0.95	0.95
Fr _t				0.850							0.992	
Flt Protected					0.950						0.950	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	1770	3511	0
Flt Permitted					0.455						0.950	
Satd. Flow (perm)	0	1863	1583	848	1863	0	0	0	0	1770	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127									7
Link Speed (mph)		30			30			30				30
Link Distance (ft)		423			482			267				255
Travel Time (s)		9.6			11.0			6.1				5.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	297	127	252	340	0	0	0	0	79	653	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	297	127	252	340	0	0	0	0	79	689	0
Turn Type		NA	Prot	pm+pt		NA				Split	NA	
Protected Phases		2	2	1	6					4	4	
Permitted Phases				6								
Detector Phase		2	2	1	6					4	4	
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Minimum Split (s)		22.5	22.5	9.5	22.5					22.5	22.5	
Total Split (s)		30.0	30.0	21.0	51.0					39.0	39.0	
Total Split (%)		33.3%	33.3%	23.3%	56.7%					43.3%	43.3%	
Maximum Green (s)		25.5	25.5	16.5	46.5					34.5	34.5	
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5	3.5	
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					0.0	0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max						None	None	
Walk Time (s)		7.0	7.0		7.0					7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0					11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0					0	0	
Act Effct Green (s)		41.1	41.1	56.9	56.9					24.1	24.1	
Actuated g/C Ratio		0.46	0.46	0.63	0.63					0.27	0.27	
v/c Ratio		0.35	0.16	0.39	0.29					0.17	0.73	
Control Delay		19.6	4.5	10.9	10.8					24.4	34.1	
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		19.6	4.5	10.9	10.8					24.4	34.1	

Lanes, Volumes, Timings

Coggeshall Street

5: Ashley Boulevard (Route 18) & Coggeshall Street

2027 PM No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B	A	B	B					C	C	
Approach Delay		15.0			10.8						33.1	
Approach LOS		B			B						C	
Queue Length 50th (ft)	104	0	95	133						34	186	
Queue Length 95th (ft)	209	37	157	223						63	223	
Internal Link Dist (ft)	343			402			187				175	
Turn Bay Length (ft)				200								
Base Capacity (vph)	850	791	705	1178						678	1350	
Starvation Cap Reductn	0	0	0	0						0	0	
Spillback Cap Reductn	0	0	0	0						0	0	
Storage Cap Reductn	0	0	0	0						0	0	
Reduced v/c Ratio	0.35	0.16	0.36	0.29						0.12	0.51	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 49 (54%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 21.4

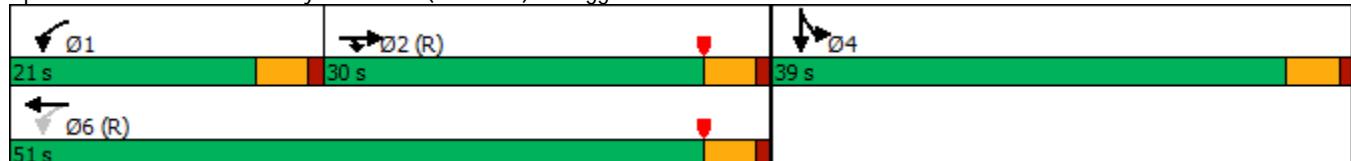
Intersection LOS: C

Intersection Capacity Utilization 63.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: Ashley Boulevard (Route 18) & Coggeshall Street



HCM 6th Signalized Intersection Summary
5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street
2027 PM No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	273	117	232	313	0	0	0	0	73	601	33
Future Volume (veh/h)	0	273	117	232	313	0	0	0	0	73	601	33
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	297	127	252	340	0				79	653	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	976	827	662	1244	0				418	804	44
Arrive On Green	0.00	0.52	0.52	0.19	1.00	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	1870	1585	1781	1870	0				1781	3425	189
Grp Volume(v), veh/h	0	297	127	252	340	0				79	339	350
Grp Sat Flow(s), veh/h/ln	0	1870	1585	1781	1870	0				1781	1777	1836
Q Serve(g_s), s	0.0	8.1	3.7	5.8	0.0	0.0				3.2	16.2	16.2
Cycle Q Clear(g_c), s	0.0	8.1	3.7	5.8	0.0	0.0				3.2	16.2	16.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.10
Lane Grp Cap(c), veh/h	0	976	827	662	1244	0				418	417	431
V/C Ratio(X)	0.00	0.30	0.15	0.38	0.27	0.00				0.19	0.81	0.81
Avail Cap(c_a), veh/h	0	976	827	822	1244	0				683	681	704
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.80	0.80	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.2	11.2	6.9	0.0	0.0				27.6	32.5	32.6
Incr Delay (d2), s/veh	0.0	0.8	0.4	0.3	0.4	0.0				0.2	3.8	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	3.4	1.3	1.6	0.2	0.0				1.4	7.2	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	13.0	11.6	7.2	0.4	0.0				27.8	36.4	36.3
LnGrp LOS	A	B	B	A	A	A				C	D	D
Approach Vol, veh/h		424			592					768		
Approach Delay, s/veh		12.6			3.3					35.5		
Approach LOS		B			A					D		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+R _c), s	12.9	51.5		25.6		64.4						
Change Period (Y+R _c), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	16.5	25.5		34.5		46.5						
Max Q Clear Time (g_c+l1), s	7.8	10.1		18.2		2.0						
Green Ext Time (p_c), s	0.6	1.5		2.9		1.4						
Intersection Summary												
HCM 6th Ctrl Delay			19.4									
HCM 6th LOS			B									

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 PM No Build Condition

	↑	→	↓	↗	↖	↙	↖	↑	↗	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	121	47	14	106	288	22	333	17	198	368	42
Future Volume (vph)	40	121	47	14	106	288	22	333	17	198	368	42
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		0.970			0.905			0.994			0.991	
Flt Protected		0.991			0.998			0.997			0.984	
Satd. Flow (prot)	0	1791	0	0	1682	0	0	1846	0	0	1816	0
Flt Permitted		0.649			0.984			0.940			0.570	
Satd. Flow (perm)	0	1173	0	0	1659	0	0	1740	0	0	1052	0
Right Turn on Red		Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		21			170			4			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		608			1839			695			734	
Travel Time (s)		13.8			41.8			15.8			16.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	132	51	15	115	313	24	362	18	215	400	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	0	0	443	0	0	404	0	0	661	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2		1	16	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	16	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0			6.0	
Minimum Split (s)	17.0	17.0		16.0	16.0		26.0	26.0			12.0	
Total Split (s)	24.0	24.0		24.0	24.0		30.0	30.0			15.0	
Total Split (%)	34.8%	34.8%		34.8%	34.8%		43.5%	43.5%			21.7%	
Maximum Green (s)	18.0	18.0		18.0	18.0		24.0	24.0			9.0	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2			3.2	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.8			2.8	
Lost Time Adjust (s)		0.0		0.0			0.0					
Total Lost Time (s)		6.0		6.0			6.0					
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		
Recall Mode	None	None		None	None		Max	Max		None		
Act Effct Green (s)		15.6			15.6			24.1			39.1	
Actuated g/C Ratio		0.23			0.23			0.36			0.59	
v/c Ratio		0.78			0.86			0.64			0.91	
Control Delay		41.8			32.6			23.9			32.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		41.8			32.6			23.9			32.4	
LOS		D			C			C			C	
Approach Delay		41.8			32.6			23.9			32.4	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)		78			107			141			171	
Queue Length 95th (ft)		#178			#253			233			#432	
Internal Link Dist (ft)		528			1759			615			654	

Lane Group	Ø6
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
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	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	45.0
Total Split (%)	65%
Maximum Green (s)	39.0
Yellow Time (s)	3.2
All-Red Time (s)	2.8
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 PM No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	332			572			630			723		
Starvation Cap Reductn	0			0			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.68			0.77			0.64			0.91		

Intersection Summary

Area Type: Other

Cycle Length: 69

Actuated Cycle Length: 66.7

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 96.0%

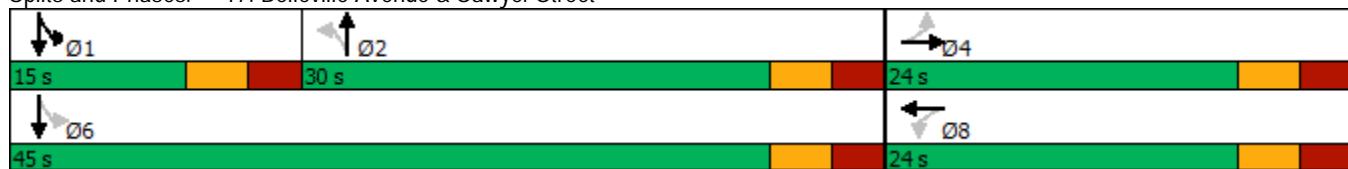
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: Belleville Avenue & Sawyer Street



Lane Group	Ø6
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 PM No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	121	47	14	106	288	22	333	17	198	368	42
Future Volume (vph)	40	121	47	14	106	288	22	333	17	198	368	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0		6.0		6.0		6.0	
Lane Util. Factor		1.00				1.00			1.00		1.00	
Frt		0.97				0.90			0.99		0.99	
Flt Protected		0.99				1.00			1.00		0.98	
Satd. Flow (prot)		1789				1682			1846		1816	
Flt Permitted		0.65				0.98			0.94		0.57	
Satd. Flow (perm)		1173				1658			1741		1052	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	132	51	15	115	313	24	362	18	215	400	46
RTOR Reduction (vph)	0	16	0	0	130	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	210	0	0	313	0	0	401	0	0	657	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4				8			2		1	1 6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.6			15.6			24.1			39.1	
Effective Green, g (s)		15.6			15.6			24.1			39.1	
Actuated g/C Ratio		0.23			0.23			0.36			0.59	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		274			387			629			719	
v/s Ratio Prot											c0.12	
v/s Ratio Perm		0.18			c0.19			0.23			c0.41	
v/c Ratio		0.77			0.81			0.64			0.91	
Uniform Delay, d1		23.8			24.1			17.7			12.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		12.0			11.7			4.9			16.1	
Delay (s)		35.9			35.9			22.6			28.4	
Level of Service		D			D			C			C	
Approach Delay (s)		35.9			35.9			22.6			28.4	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		29.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		66.7			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		96.0%			ICU Level of Service			F				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings
1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street
Coggeshall Street
2027 PM Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	109	441	226	298	230	132	209	188	46	164	193	65
Future Volume (vph)	109	441	226	298	230	132	209	188	46	164	193	65
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	0.95	1.00	1.00	1.00
Frt				0.850		0.945			0.970			0.850
Flt Protected	0.950				0.950			0.950			0.950	
Satd. Flow (prot)	1770	1863	1583	1770	1760	0	1770	3433	0	1770	1863	1583
Flt Permitted	0.475				0.260			0.385			0.950	
Satd. Flow (perm)	885	1863	1583	484	1760	0	717	3433	0	1770	1863	1583
Right Turn on Red				Yes			Yes			Yes		Yes
Satd. Flow (RTOR)						38			27			73
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			460			227			299	
Travel Time (s)		8.9			10.5			5.2			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	479	246	324	250	143	227	204	50	178	210	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	479	246	324	393	0	227	254	0	178	210	71
Turn Type	pm+pt	NA	custom	pm+pt	NA		pm+pt	NA		Prot	NA	pt+ov
Protected Phases	5	2	2	1	6		3	8		7	4	4 5
Permitted Phases	2	1	3	4	5	6		8				
Detector Phase	5	2	2	1	6		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	22.5	22.5	10.5	22.5		10.5	10.5		10.5	10.5	
Total Split (s)	20.0	40.0	40.0	20.0	40.0		15.0	15.0		15.0	15.0	
Total Split (%)	22.2%	44.4%	44.4%	22.2%	44.4%		16.7%	16.7%		16.7%	16.7%	
Maximum Green (s)	15.5	35.5	35.5	15.5	35.5		10.5	10.5		10.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	None		None	None	
Act Effct Green (s)	43.5	35.5	87.3	52.6	40.5		20.8	10.4		10.5	10.5	22.9
Actuated g/C Ratio	0.50	0.41	1.00	0.60	0.46		0.24	0.12		0.12	0.12	0.26
v/c Ratio	0.23	0.63	0.16	0.68	0.47		0.77	0.59		0.84	0.94	0.15
Control Delay	9.0	25.7	0.2	15.9	16.8		45.5	38.9		71.6	87.0	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	9.0	25.7	0.2	15.9	16.8		45.5	38.9		71.6	87.0	7.1
LOS	A	C	A	B	B		D	D		E	F	A
Approach Delay			15.9			16.4			42.0			68.7
Approach LOS			B			B			D			E
Queue Length 50th (ft)	25	207	0	79	128		102	63		98	117	0
Queue Length 95th (ft)	47	325	0	123	214		#188	105		#217	#259	30
Internal Link Dist (ft)		310			380			147			219	

Lanes, Volumes, Timings

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

Coggeshall Street

2027 PM Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	671	758	1583	521	836		298	437		213	224	601
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.18	0.63	0.16	0.62	0.47		0.76	0.58		0.84	0.94	0.12

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 30.8

Intersection LOS: C

Intersection Capacity Utilization 76.5%

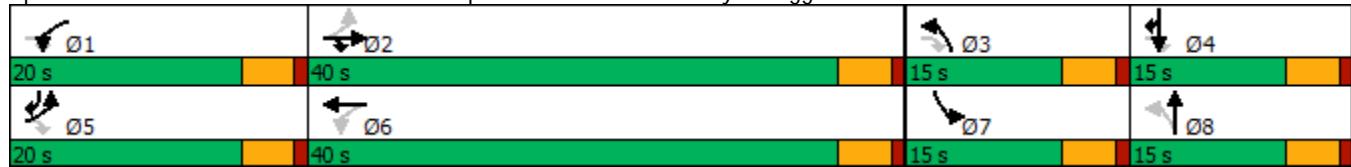
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street



HCM 6th Signalized Intersection Summary

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

Coggeshall Street

2027 PM Build Condition



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	109	441	226	298	230	132	209	188	46	164	193	65
Future Volume (veh/h)	109	441	226	298	230	132	209	188	46	164	193	65
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	118	479	0	324	250	143	227	204	50	178	210	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	525	778		508	533	305	317	359	86	213	230	300
Arrive On Green	0.07	0.42	0.00	0.13	0.48	0.48	0.12	0.13	0.13	0.12	0.12	0.12
Sat Flow, veh/h	1781	1870	1585	1781	1117	639	1781	2843	681	1781	1870	1585
Grp Volume(v), veh/h	118	479	0	324	0	393	227	126	128	178	210	71
Grp Sat Flow(s), veh/h/ln	1781	1870	1585	1781	0	1755	1781	1777	1748	1781	1870	1585
Q Serve(g_s), s	3.1	17.2	0.0	8.2	0.0	12.9	9.4	5.7	5.9	8.3	9.5	3.2
Cycle Q Clear(g_c), s	3.1	17.2	0.0	8.2	0.0	12.9	9.4	5.7	5.9	8.3	9.5	3.2
Prop In Lane	1.00		1.00	1.00		0.36	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	525	778		508	0	838	317	225	221	213	230	300
V/C Ratio(X)	0.22	0.62		0.64	0.00	0.47	0.72	0.56	0.58	0.84	0.91	0.24
Avail Cap(c_a), veh/h	731	778		604	0	838	317	225	221	219	230	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	19.6	0.0	13.1	0.0	15.0	28.4	35.1	35.2	36.8	37.0	29.4
Incr Delay (d2), s/veh	0.2	3.6	0.0	1.7	0.0	1.9	7.6	3.1	3.8	23.2	36.6	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.2	7.8	0.0	3.1	0.0	5.3	4.6	2.6	2.7	4.9	6.6	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	12.9	23.2	0.0	14.8	0.0	16.9	36.0	38.2	38.9	59.9	73.6	29.8
LnGrp LOS	B	C		B	A	B	D	D	D	E	E	C
Approach Vol, veh/h			A			717			481			459
Approach Delay, s/veh	21.2					16.0			37.3			61.5
Approach LOS			C			B			D			E

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+R _c), s	15.4	40.0	15.0	15.0	10.1	45.2	14.7	15.3
Change Period (Y+R _c), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	35.5	10.5	10.5	15.5	35.5	10.5	10.5
Max Q Clear Time (g_c+l1), s	10.2	19.2	11.4	11.5	5.1	14.9	10.3	7.9
Green Ext Time (p_c), s	0.7	3.9	0.0	0.0	0.5	1.8	0.0	0.4

Intersection Summary

HCM 6th Ctrl Delay 31.2

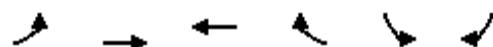
HCM 6th LOS C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings
2: Coggeshall Street & Site Driveway

Coggeshall Street
2027 PM Build Condition



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	
Traffic Volume (vph)	78	775	471	32	8	82
Future Volume (vph)	78	775	471	32	8	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.991		0.877	
Flt Protected	0.950				0.995	
Satd. Flow (prot)	1770	1863	1846	0	1625	0
Flt Permitted	0.950				0.995	
Satd. Flow (perm)	1770	1863	1846	0	1625	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		705	390		266	
Travel Time (s)		16.0	8.9		6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	842	512	35	9	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	85	842	547	0	98	0
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 53.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗	↘		
Traffic Vol, veh/h	78	775	471	32	8	82
Future Vol, veh/h	78	775	471	32	8	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	85	842	512	35	9	89
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	547	0	-	0	1542	530
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	1012	-
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	1022	-	-	-	127	549
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	351	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1022	-	-	-	116	549
Mov Cap-2 Maneuver	-	-	-	-	116	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	351	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.8	0	16.4			
HCM LOS			C			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1022	-	-	-	412	
HCM Lane V/C Ratio	0.083	-	-	-	0.237	
HCM Control Delay (s)	8.8	-	-	-	16.4	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	

Lanes, Volumes, Timings
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 PM Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑	↑	↑	↑	↑	↓	
Traffic Volume (vph)	95	388	46	160	392	103	52	210	481	159	142	147
Future Volume (vph)	95	388	46	160	392	103	52	210	481	159	142	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110			0	130		215	0		0	125	0
Storage Lanes	1			0	1		1	0		1	1	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			0.850			0.924
Flt Protected	0.950				0.950				0.990		0.950	
Satd. Flow (prot)	1770	1833	0	1770	1863	1583	0	1844	1583	1770	1721	0
Flt Permitted	0.330				0.195				0.846		0.256	
Satd. Flow (perm)	615	1833	0	363	1863	1583	0	1576	1583	477	1721	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				145			156			82
Link Speed (mph)		30			30			30				30
Link Distance (ft)		1007			705			228				695
Travel Time (s)		22.9			16.0			5.2				15.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	422	50	174	426	112	57	228	523	173	154	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	472	0	174	426	112	0	285	523	173	314	0
Turn Type	pm+pt	NA		pm+pt	NA	pt+ov	Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	5	2		1	6	6 7		8	1	7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6	6 7	8	8	1	7	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.5	15.5		12.0	16.0		12.0	12.0	12.0	12.5	12.5	
Total Split (s)	22.0	22.0		17.0	17.0		20.0	20.0	17.0	12.5	32.5	
Total Split (%)	30.8%	30.8%		23.8%	23.8%		28.0%	28.0%	23.8%	17.5%	45.5%	
Maximum Green (s)	16.5	16.5		11.0	11.0		14.0	14.0	11.0	6.0	26.0	
Yellow Time (s)	3.0	3.0		3.5	3.0		3.5	3.5	3.5	3.0	3.0	
All-Red Time (s)	2.5	2.5		2.5	3.0		2.5	2.5	2.5	3.5	3.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0			6.0	6.0	6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	None	None	None	None	
Act Effct Green (s)	24.4	16.5		28.6	20.5	33.0		14.0	29.5	26.0	26.0	
Actuated g/C Ratio	0.35	0.24		0.41	0.29	0.47		0.20	0.42	0.37	0.37	
v/c Ratio	0.30	1.08		0.51	0.78	0.14		0.90	0.69	0.60	0.45	
Control Delay	13.8	94.8		17.9	37.6	1.9		62.8	16.8	26.3	14.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	13.8	94.8		17.9	37.6	1.9		62.8	16.8	26.3	14.9	
LOS	B	F		B	D	A		E	B	C	B	
Approach Delay	80.3				27.1			33.0			18.9	
Approach LOS		F			C			C			B	

Lanes, Volumes, Timings
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 PM Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	24	~237		44	176	0		124	122	52	73	
Queue Length 95th (ft)	50	#414		81	#352	17		#262	230	#103	141	
Internal Link Dist (ft)		927			625			148			615	
Turn Bay Length (ft)	110			130		215				125		
Base Capacity (vph)	551	438		372	545	823		315	788	287	691	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.19	1.08		0.47	0.78	0.14		0.90	0.66	0.60	0.45	

Intersection Summary

Area Type: Other

Cycle Length: 71.5

Actuated Cycle Length: 70

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 39.3

Intersection LOS: D

Intersection Capacity Utilization 84.5%

ICU Level of Service E

Analysis Period (min) 15

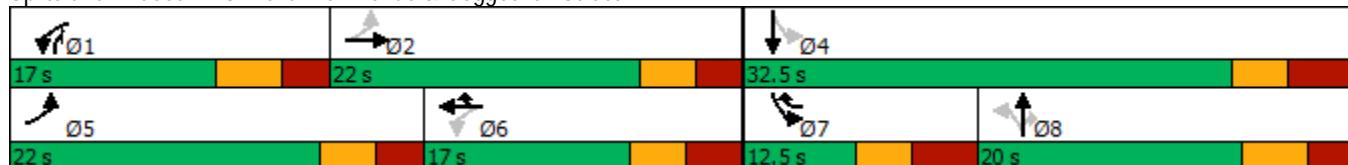
~ Volume exceeds capacity, queue is theoretically infinite.

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: 3: Belleville Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 PM Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑	↑	↑	↑	↑	↓	
Traffic Volume (veh/h)	95	388	46	160	392	103	52	210	481	159	142	147
Future Volume (veh/h)	95	388	46	160	392	103	52	210	481	159	142	147
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	422	50	174	426	112	57	228	523	173	154	160
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	396	47	283	511	572	113	296	483	294	326	339
Arrive On Green	0.08	0.24	0.24	0.10	0.27	0.27	0.20	0.20	0.20	0.09	0.39	0.39
Sat Flow, veh/h	1781	1641	194	1781	1870	1585	244	1443	1585	1781	840	873
Grp Volume(v), veh/h	103	0	472	174	426	112	285	0	523	173	0	314
Grp Sat Flow(s), veh/h/ln	1781	0	1835	1781	1870	1585	1686	0	1585	1781	0	1713
Q Serve(g_s), s	2.9	0.0	16.5	4.9	14.6	3.3	7.4	0.0	14.0	5.0	0.0	9.4
Cycle Q Clear(g_c), s	2.9	0.0	16.5	4.9	14.6	3.3	10.9	0.0	14.0	5.0	0.0	9.4
Prop In Lane	1.00		0.11	1.00		1.00	0.20		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	291	0	443	283	511	572	409	0	483	294	0	664
V/C Ratio(X)	0.35	0.00	1.06	0.61	0.83	0.20	0.70	0.00	1.08	0.59	0.00	0.47
Avail Cap(c_a), veh/h	587	0	443	392	511	572	409	0	483	294	0	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	25.9	18.4	23.4	15.0	25.8	0.0	23.7	19.0	0.0	15.7
Incr Delay (d2), s/veh	0.7	0.0	61.1	2.2	14.7	0.8	5.1	0.0	65.1	3.1	0.0	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.2	0.0	14.3	2.0	8.1	1.2	4.8	0.0	15.9	2.2	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.9	0.0	87.0	20.6	38.1	15.8	30.9	0.0	88.8	22.0	0.0	16.2
LnGrp LOS	B	A	F	C	D	B	C	A	F	C	A	B
Approach Vol, veh/h						712			808			487
Approach Delay, s/veh						30.3			68.4			18.3
Approach LOS						C			E			B
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	22.5		33.0	10.7	24.7	12.5	20.5				
Change Period (Y+Rc), s	6.0	* 6		6.5	5.5	6.0	6.5	* 6.5				
Max Green Setting (Gmax), s	11.0	* 17		26.0	16.5	11.0	6.0	* 14				
Max Q Clear Time (g_c+l1), s	6.9	18.5		11.4	4.9	16.6	7.0	16.0				
Green Ext Time (p_c), s	0.2	0.0		1.1	0.2	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	49.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

2027 PM Build Condition

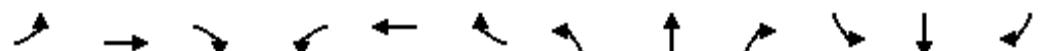
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↔		↑	↑	↑			
Traffic Volume (vph)	57	301	0	0	423	88	130	404	263	0	0	0
Future Volume (vph)	57	301	0	0	423	88	130	404	263	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0	0	0
Storage Lanes	1		0	0		0	1		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
Fr _t					0.977				0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	1863	0	0	1820	0	1770	1863	1583	0	0	0
Flt Permitted	0.229						0.950					
Satd. Flow (perm)	427	1863	0	0	1820	0	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11				286			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		482			1007			248			274	
Travel Time (s)		11.0			22.9			5.6			6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	327	0	0	460	96	141	439	286	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	327	0	0	556	0	141	439	286	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Prot			
Protected Phases	5	2			6			8	8			
Permitted Phases	2						8					
Detector Phase	5	2			6		8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0	5.0			
Minimum Split (s)	9.5	22.5			22.5		22.5	22.5	22.5			
Total Split (s)	27.0	55.0			28.0		35.0	35.0	35.0			
Total Split (%)	30.0%	61.1%			31.1%		38.9%	38.9%	38.9%			
Maximum Green (s)	22.5	50.5			23.5		30.5	30.5	30.5			
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5			
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	0.0	0.0			
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max		Max	Max	Max			
Walk Time (s)		7.0			7.0		7.0	7.0	7.0			
Flash Dont Walk (s)		11.0			11.0		11.0	11.0	11.0			
Pedestrian Calls (#/hr)		0			0		0	0	0			
Act Effct Green (s)	50.5	50.5			41.1		30.5	30.5	30.5			
Actuated g/C Ratio	0.56	0.56			0.46		0.34	0.34	0.34			
v/c Ratio	0.18	0.31			0.67		0.24	0.70	0.39			
Control Delay	7.3	11.4			24.6		22.7	32.7	4.5			
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0			
Total Delay	7.3	11.4			24.6		22.7	32.7	4.5			

Lanes, Volumes, Timings

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

Coggeshall Street

2027 PM Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B		C			C	C	A			
Approach Delay		10.7			24.6				21.8			
Approach LOS			B		C			C				
Queue Length 50th (ft)	22	132			244		57	214	0			
Queue Length 95th (ft)	13	197			379		103	322	53			
Internal Link Dist (ft)		402			927			168				194
Turn Bay Length (ft)		150										
Base Capacity (vph)	575	1045			836		599	631	725			
Starvation Cap Reductn	0	0			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.11	0.31			0.67		0.24	0.70	0.39			

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 20.3

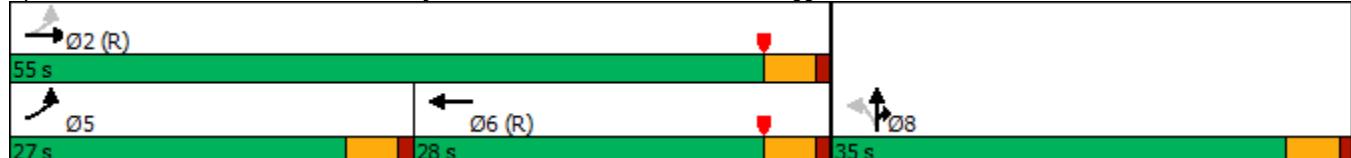
Intersection LOS: C

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

Coggeshall Street

2027 PM Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↔		↑	↑	↑	0	0	0
Traffic Volume (veh/h)	57	301	0	0	423	88	130	404	263	0	0	0
Future Volume (veh/h)	57	301	0	0	423	88	130	404	263	0	0	0
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	62	327	0	0	460	96	141	439	286			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	356	1049	0	0	701	146	604	634	537			
Arrive On Green	0.01	0.19	0.00	0.00	0.47	0.47	0.34	0.34	0.34			
Sat Flow, veh/h	1781	1870	0	0	1501	313	1781	1870	1585			
Grp Volume(v), veh/h	62	327	0	0	0	556	141	439	286			
Grp Sat Flow(s), veh/h/h/ln	1781	1870	0	0	0	1814	1781	1870	1585			
Q Serve(g_s), s	1.5	13.6	0.0	0.0	0.0	21.2	5.1	18.2	13.1			
Cycle Q Clear(g_c), s	1.5	13.6	0.0	0.0	0.0	21.2	5.1	18.2	13.1			
Prop In Lane	1.00		0.00	0.00		0.17	1.00		1.00			
Lane Grp Cap(c), veh/h	356	1049	0	0	0	848	604	634	537			
V/C Ratio(X)	0.17	0.31	0.00	0.00	0.00	0.66	0.23	0.69	0.53			
Avail Cap(c_a), veh/h	723	1049	0	0	0	848	604	634	537			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.96	0.96	0.00	0.00	0.00	0.53	1.00	1.00	1.00			
Uniform Delay (d), s/veh	13.8	21.6	0.0	0.0	0.0	18.4	21.4	25.7	24.0			
Incr Delay (d2), s/veh	0.2	0.7	0.0	0.0	0.0	2.1	0.9	6.1	3.7			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.6	7.0	0.0	0.0	0.0	8.9	2.2	8.9	5.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	14.0	22.4	0.0	0.0	0.0	20.5	22.3	31.8	27.7			
LnGrp LOS	B	C	A	A	A	C	C	C	C			
Approach Vol, veh/h		389			556			866				
Approach Delay, s/veh		21.0			20.5			28.9				
Approach LOS		C			C			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+R _c), s		55.0			8.4	46.6		35.0				
Change Period (Y+R _c), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			22.5	23.5		30.5				
Max Q Clear Time (g_c+l1), s		15.6			3.5	23.2		20.2				
Green Ext Time (p_c), s		1.3			0.1	0.1		2.8				
Intersection Summary												
HCM 6th Ctrl Delay		24.7										
HCM 6th LOS		C										

Lanes, Volumes, Timings

Coggeshall Street

5: Ashley Boulevard (Route 18) & Coggeshall Street

2027 PM Build Condition

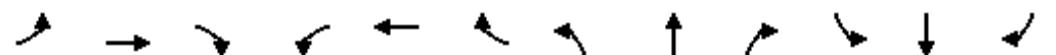
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑					↑	↑↑	
Traffic Volume (vph)	0	278	117	240	318	0	0	0	0	73	601	33
Future Volume (vph)	0	278	117	240	318	0	0	0	0	73	601	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0	0	0
Storage Lanes	0		1	1		0	0		0	1		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	0.95	0.95
Frt				0.850							0.992	
Flt Protected					0.950						0.950	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	1770	3511	0
Flt Permitted					0.450						0.950	
Satd. Flow (perm)	0	1863	1583	838	1863	0	0	0	0	1770	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127									7
Link Speed (mph)		30			30			30				30
Link Distance (ft)		423			482			267				255
Travel Time (s)		9.6			11.0			6.1				5.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	302	127	261	346	0	0	0	0	79	653	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	302	127	261	346	0	0	0	0	79	689	0
Turn Type		NA	Prot	pm+pt		NA				Split	NA	
Protected Phases		2	2	1	6					4	4	
Permitted Phases				6								
Detector Phase		2	2	1	6					4	4	
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Minimum Split (s)		22.5	22.5	9.5	22.5					22.5	22.5	
Total Split (s)		30.0	30.0	21.0	51.0					39.0	39.0	
Total Split (%)		33.3%	33.3%	23.3%	56.7%					43.3%	43.3%	
Maximum Green (s)		25.5	25.5	16.5	46.5					34.5	34.5	
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5	3.5	
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					0.0	0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max						None	None	
Walk Time (s)		7.0	7.0		7.0					7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0					11.0	11.0	
Pedestrian Calls (#/hr)		0	0		0					0	0	
Act Effct Green (s)		40.8	40.8	56.9	56.9					24.1	24.1	
Actuated g/C Ratio		0.45	0.45	0.63	0.63					0.27	0.27	
v/c Ratio		0.36	0.16	0.40	0.29					0.17	0.73	
Control Delay		19.9	4.5	11.0	10.8					24.4	34.1	
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		19.9	4.5	11.0	10.8					24.4	34.1	

Lanes, Volumes, Timings

5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street

2027 PM Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B	A	B	B					C	C	
Approach Delay		15.3			10.9						33.1	
Approach LOS		B			B						C	
Queue Length 50th (ft)	106	0	100	137						34	186	
Queue Length 95th (ft)	216	38	161	229						63	223	
Internal Link Dist (ft)	343			402				187			175	
Turn Bay Length (ft)				200								
Base Capacity (vph)	844	787	701	1178						678	1350	
Starvation Cap Reductn	0	0	0	0						0	0	
Spillback Cap Reductn	0	0	0	0						0	0	
Storage Cap Reductn	0	0	0	0						0	0	
Reduced v/c Ratio	0.36	0.16	0.37	0.29						0.12	0.51	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 49 (54%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 21.4

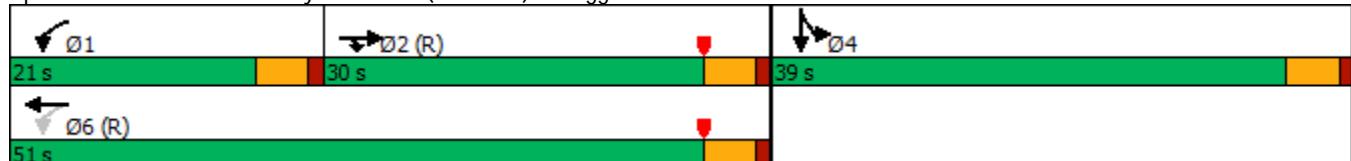
Intersection LOS: C

Intersection Capacity Utilization 64.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 5: Ashley Boulevard (Route 18) & Coggeshall Street



HCM 6th Signalized Intersection Summary
5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street
2027 PM Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	278	117	240	318	0	0	0	0	73	601	33
Future Volume (veh/h)	0	278	117	240	318	0	0	0	0	73	601	33
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	302	127	261	346	0				79	653	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	970	822	660	1244	0				418	804	44
Arrive On Green	0.00	0.52	0.52	0.19	1.00	0.00				0.23	0.23	0.23
Sat Flow, veh/h	0	1870	1585	1781	1870	0				1781	3425	189
Grp Volume(v), veh/h	0	302	127	261	346	0				79	339	350
Grp Sat Flow(s), veh/h/ln	0	1870	1585	1781	1870	0				1781	1777	1836
Q Serve(g_s), s	0.0	8.3	3.8	6.0	0.0	0.0				3.2	16.2	16.2
Cycle Q Clear(g_c), s	0.0	8.3	3.8	6.0	0.0	0.0				3.2	16.2	16.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.10
Lane Grp Cap(c), veh/h	0	970	822	660	1244	0				418	417	431
V/C Ratio(X)	0.00	0.31	0.15	0.40	0.28	0.00				0.19	0.81	0.81
Avail Cap(c_a), veh/h	0	970	822	815	1244	0				683	681	704
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.79	0.79	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.4	11.3	7.0	0.0	0.0				27.6	32.5	32.6
Incr Delay (d2), s/veh	0.0	0.8	0.4	0.3	0.4	0.0				0.2	3.8	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	3.5	1.4	1.7	0.2	0.0				1.4	7.2	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	13.3	11.7	7.3	0.4	0.0				27.8	36.4	36.3
LnGrp LOS	A	B	B	A	A	A				C	D	D
Approach Vol, veh/h		429			607					768		
Approach Delay, s/veh		12.8			3.4					35.5		
Approach LOS		B			A					D		
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+R _c), s	13.2	51.2		25.6		64.4						
Change Period (Y+R _c), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	16.5	25.5		34.5		46.5						
Max Q Clear Time (g_c+l1), s	8.0	10.3		18.2		2.0						
Green Ext Time (p_c), s	0.6	1.5		2.9		1.4						
Intersection Summary												
HCM 6th Ctrl Delay			19.3									
HCM 6th LOS			B									

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 PM Build Condition

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	121	47	14	106	293	22	333	17	203	368	42
Future Volume (vph)	40	121	47	14	106	293	22	333	17	203	368	42
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		0.970			0.904			0.994			0.991	
Flt Protected		0.991			0.998			0.997			0.984	
Satd. Flow (prot)	0	1791	0	0	1681	0	0	1846	0	0	1816	0
Flt Permitted		0.643			0.984			0.940			0.566	
Satd. Flow (perm)	0	1162	0	0	1657	0	0	1740	0	0	1045	0
Right Turn on Red		Yes				Yes			Yes			Yes
Satd. Flow (RTOR)		21			173			4			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		608			1839			695			734	
Travel Time (s)		13.8			41.8			15.8			16.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	132	51	15	115	318	24	362	18	221	400	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	226	0	0	448	0	0	404	0	0	667	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2		1	16	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	16	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		6.0		
Minimum Split (s)	17.0	17.0		16.0	16.0		26.0	26.0		12.0		
Total Split (s)	24.0	24.0		24.0	24.0		30.0	30.0		15.0		
Total Split (%)	34.8%	34.8%		34.8%	34.8%		43.5%	43.5%		21.7%		
Maximum Green (s)	18.0	18.0		18.0	18.0		24.0	24.0		9.0		
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2		3.2		
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.8		2.8		
Lost Time Adjust (s)		0.0		0.0			0.0					
Total Lost Time (s)		6.0		6.0			6.0					
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		
Recall Mode	None	None		None	None		Max	Max		Max		
Act Effct Green (s)		15.6			15.6			24.0			39.1	
Actuated g/C Ratio		0.23			0.23			0.36			0.59	
v/c Ratio		0.78			0.86			0.64			0.93	
Control Delay		42.5			33.0			23.9			34.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		42.5			33.0			23.9			34.5	
LOS		D			C			C			C	
Approach Delay		42.5			33.0			23.9			34.5	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)		78			108			141			173	
Queue Length 95th (ft)		#180			#256			233			#449	
Internal Link Dist (ft)		528			1759			615			654	

Lane Group	Ø6
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
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	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	24.0
Total Split (s)	45.0
Total Split (%)	65%
Maximum Green (s)	39.0
Yellow Time (s)	3.2
All-Red Time (s)	2.8
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 PM Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	329			574			629			720		
Starvation Cap Reductn	0			0			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.69			0.78			0.64			0.93		

Intersection Summary

Area Type: Other

Cycle Length: 69

Actuated Cycle Length: 66.7

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 32.7

Intersection LOS: C

Intersection Capacity Utilization 96.4%

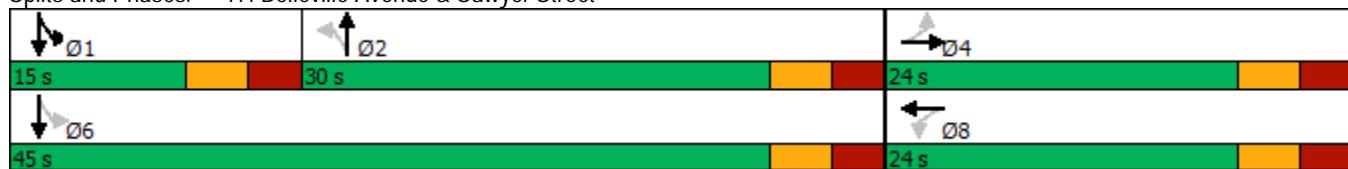
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: Belleville Avenue & Sawyer Street



Lane Group	Ø6
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 PM Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	121	47	14	106	293	22	333	17	203	368	42
Future Volume (vph)	40	121	47	14	106	293	22	333	17	203	368	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0		6.0		6.0		6.0	
Lane Util. Factor		1.00				1.00			1.00		1.00	
Frt		0.97				0.90			0.99		0.99	
Flt Protected		0.99				1.00			1.00		0.98	
Satd. Flow (prot)		1789				1681			1846		1815	
Flt Permitted		0.64				0.98			0.94		0.57	
Satd. Flow (perm)		1162				1658			1740		1045	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	132	51	15	115	318	24	362	18	221	400	46
RTOR Reduction (vph)	0	16	0	0	133	0	0	3	0	0	4	0
Lane Group Flow (vph)	0	210	0	0	315	0	0	401	0	0	663	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4				8			2		1	1 6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		15.6			15.6			24.1			39.1	
Effective Green, g (s)		15.6			15.6			24.1			39.1	
Actuated g/C Ratio		0.23			0.23			0.36			0.59	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)	271			387			628			716		
v/s Ratio Prot											c0.12	
v/s Ratio Perm		0.18			c0.19			0.23			c0.42	
v/c Ratio		0.77			0.82			0.64			0.93	
Uniform Delay, d1		23.9			24.2			17.7			12.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		12.9			12.4			4.9			19.8	
Delay (s)		36.8			36.6			22.6			32.3	
Level of Service		D			D			C			C	
Approach Delay (s)		36.8			36.6			22.6			32.3	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		31.7			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.98										
Actuated Cycle Length (s)		66.7			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		96.4%			ICU Level of Service			F				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

2027 Sat. No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↘	↑ ↗	↑ ↘	↑ ↘	↑ ↗		↑ ↘	↑ ↗		↑ ↘	↑ ↗	↑ ↘
Traffic Volume (vph)	91	320	195	257	173	121	98	101	28	157	147	68
Future Volume (vph)	91	320	195	257	173	121	98	101	28	157	147	68
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	0.95	1.00	1.00	1.00
Frt				0.850		0.938			0.968			0.850
Flt Protected	0.950				0.950			0.950			0.950	
Satd. Flow (prot)	1770	1863	1583	1770	1747	0	1770	3426	0	1770	1863	1583
Flt Permitted	0.567				0.370			0.656			0.950	
Satd. Flow (perm)	1056	1863	1583	689	1747	0	1222	3426	0	1770	1863	1583
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)						42			30			74
Link Speed (mph)	30				30			30			30	
Link Distance (ft)	390				460			227			299	
Travel Time (s)	8.9				10.5			5.2			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	348	212	279	188	132	107	110	30	171	160	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	99	348	212	279	320	0	107	140	0	171	160	74
Turn Type	pm+pt	NA	custom	pm+pt	NA		pm+pt	NA		Prot	NA	pt+ov
Protected Phases	5	2	2	1	6		3	8		7	4	4 5
Permitted Phases	2	1 3 4 5	6				8					
Detector Phase	5	2	2	1	6		3	8		7	4	4 5
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	22.5	22.5	10.5	22.5		10.5	10.5		10.5	10.5	
Total Split (s)	25.0	35.0	35.0	25.0	35.0		15.0	15.0		15.0	15.0	
Total Split (%)	27.8%	38.9%	38.9%	27.8%	38.9%		16.7%	16.7%		16.7%	16.7%	
Maximum Green (s)	20.5	30.5	30.5	20.5	30.5		10.5	10.5		10.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	None		None	None	
Act Effct Green (s)	38.1	30.6	79.3	46.5	37.1		17.2	8.6		10.3	12.6	24.6
Actuated g/C Ratio	0.48	0.39	1.00	0.59	0.47		0.22	0.11		0.13	0.16	0.31
v/c Ratio	0.17	0.48	0.13	0.50	0.38		0.33	0.35		0.75	0.54	0.14
Control Delay	8.8	22.2	0.2	11.4	14.8		24.8	28.6		56.1	41.9	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.8	22.2	0.2	11.4	14.8		24.8	28.6		56.1	41.9	6.8
LOS	A	C	A	B	B		C	C		E	D	A
Approach Delay		13.1			13.2			27.0			41.5	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	20	128	0	62	90		39	26		83	77	0
Queue Length 95th (ft)	41	228	0	106	165		82	56		#194	#172	30
Internal Link Dist (ft)		310			380			147			219	

Lanes, Volumes, Timings

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

2027 Sat. No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	809	719	1583	687	840		367	481		235	296	791
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.12	0.48	0.13	0.41	0.38		0.29	0.29		0.73	0.54	0.09

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 79.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 20.9

Intersection LOS: C

Intersection Capacity Utilization 59.8%

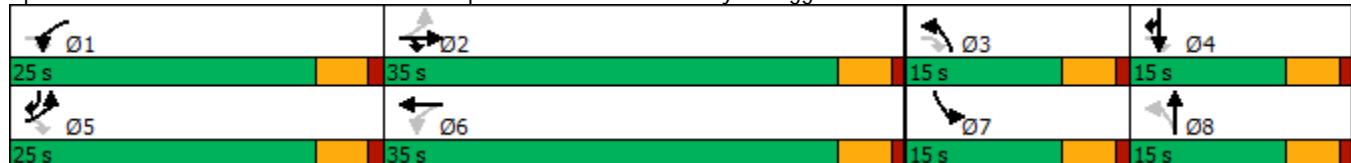
ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street



HCM 6th Signalized Intersection Summary

Coggeshall Street

I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street

2027 Sat. No Build Condition



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	320	195	257	173	121	98	101	28	157	147	68
Future Volume (veh/h)	91	320	195	257	173	121	98	101	28	157	147	68
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	99	348	0	279	188	132	107	110	30	171	160	74
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	611	800	625	488	343	281	219	58	212	231	310	
Arrive On Green	0.07	0.43	0.00	0.12	0.48	0.48	0.07	0.08	0.08	0.12	0.12	0.12
Sat Flow, veh/h	1781	1870	1585	1781	1023	718	1781	2782	734	1781	1870	1585
Grp Volume(v), veh/h	99	348	0	279	0	320	107	69	71	171	160	74
Grp Sat Flow(s), veh/h/ln	1781	1870	1585	1781	0	1741	1781	1777	1738	1781	1870	1585
Q Serve(g_s), s	2.1	9.3	0.0	5.8	0.0	8.4	3.9	2.6	2.8	6.7	5.8	2.8
Cycle Q Clear(g_c), s	2.1	9.3	0.0	5.8	0.0	8.4	3.9	2.6	2.8	6.7	5.8	2.8
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	611	800	625	0	831	281	140	137	212	231	310	
V/C Ratio(X)	0.16	0.43	0.45	0.00	0.39	0.38	0.49	0.49	0.52	0.81	0.69	0.24
Avail Cap(c_a), veh/h	994	800	920	0	831	411	262	256	262	275	348	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	14.3	0.0	9.1	0.0	11.9	27.2	31.5	31.5	30.6	30.0	24.2
Incr Delay (d2), s/veh	0.1	1.7	0.0	0.5	0.0	1.3	0.8	2.7	3.0	13.9	5.8	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.8	4.0	0.0	2.0	0.0	3.2	1.6	1.2	1.3	3.6	2.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	9.7	16.1	0.0	9.6	0.0	13.3	28.1	34.1	34.5	44.5	35.8	24.6
LnGrp LOS	A	B		A	A	B	C	C	C	D	D	C
Approach Vol, veh/h	447	A			599			247			405	
Approach Delay, s/veh	14.7				11.5			31.6			37.4	
Approach LOS		B			B			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	35.0	9.8	13.3	9.7	38.5	13.0	10.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	20.5	30.5	10.5	10.5	20.5	30.5	10.5	10.5				
Max Q Clear Time (g_c+l1), s	7.8	11.3	5.9	7.8	4.1	10.4	8.7	4.8				
Green Ext Time (p_c), s	1.0	2.8	0.2	0.2	0.5	1.4	0.1	0.3				

Intersection Summary

HCM 6th Ctrl Delay

21.5

HCM 6th LOS

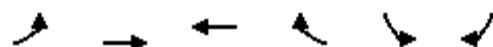
C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Lanes, Volumes, Timings
2: Coggeshall Street & Site Driveway

Coggeshall Street
2027 Sat. No Build Condition



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	
Traffic Volume (vph)	69	557	331	16	18	52
Future Volume (vph)	69	557	331	16	18	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.994			0.865
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1852	0	0	1611
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1852	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		705	390		266	
Travel Time (s)		16.0	8.9		6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	605	360	17	20	57
Shared Lane Traffic (%)						
Lane Group Flow (vph)	75	605	377	0	20	57
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↗	
Traffic Vol, veh/h	69	557	331	16	18	52
Future Vol, veh/h	69	557	331	16	18	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	75	605	360	17	20	57

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	377	0	-	0	1124	369
Stage 1	-	-	-	-	369	-
Stage 2	-	-	-	-	755	-
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	1181	-	-	-	227	677
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	464	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1181	-	-	-	212	677
Mov Cap-2 Maneuver	-	-	-	-	212	-
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	464	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	10.8
HCM LOS		B	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1181	-	-	-	677
HCM Lane V/C Ratio	0.064	-	-	-	0.083
HCM Control Delay (s)	8.3	-	-	-	10.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

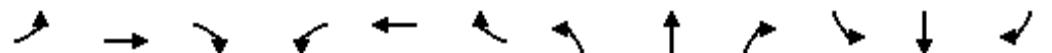
Lanes, Volumes, Timings
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 Sat. No Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑		↑	↑	↑	↓	
Traffic Volume (vph)	65	298	66	119	318	61	43	145	343	145	115	123
Future Volume (vph)	65	298	66	119	318	61	43	145	343	145	115	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	130		215	0		0	125		0
Storage Lanes	1		0	1		1	0		1	1		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		0.973				0.850			0.850		0.922	
Flt Protected	0.950			0.950				0.989		0.950		
Satd. Flow (prot)	1770	1812	0	1770	1863	1583	0	1842	1583	1770	1717	0
Flt Permitted	0.551			0.235				0.844		0.363		
Satd. Flow (perm)	1026	1812	0	438	1863	1583	0	1572	1583	676	1717	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				145			243		85	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1007			705			228			695	
Travel Time (s)		22.9			16.0			5.2			15.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	324	72	129	346	66	47	158	373	158	125	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	396	0	129	346	66	0	205	373	158	259	0
Turn Type	pm+pt	NA		pm+pt	NA	pt+ov	Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	5	2		1	6	6 7		8	1	7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6	6 7	8	8	1	7	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.5	15.5		12.0	16.0		12.0	12.0	12.0	12.5	12.5	
Total Split (s)	22.0	22.0		17.0	17.0		20.0	20.0	17.0	12.5	32.5	
Total Split (%)	30.8%	30.8%		23.8%	23.8%		28.0%	28.0%	23.8%	17.5%	45.5%	
Maximum Green (s)	16.5	16.5		11.0	11.0		14.0	14.0	11.0	6.0	26.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.5	3.5	3.0	3.0	3.0	
All-Red Time (s)	2.5	2.5		3.0	3.0		2.5	2.5	3.0	3.5	3.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0			6.0	6.0	6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	None	None	None	None	
Act Effct Green (s)	24.1	16.8		29.2	23.6	36.4		12.4	27.1	21.3	21.3	
Actuated g/C Ratio	0.37	0.26		0.45	0.36	0.56		0.19	0.42	0.33	0.33	
v/c Ratio	0.15	0.83		0.35	0.51	0.07		0.69	0.47	0.49	0.42	
Control Delay	12.0	41.9		14.2	24.4	0.1		39.5	7.3	21.3	13.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	12.0	41.9		14.2	24.4	0.1		39.5	7.3	21.3	13.1	
LOS	B	D		B	C	A		D	A	C	B	
Approach Delay		37.3			19.0			18.7			16.2	
Approach LOS		D			B			B			B	

Lanes, Volumes, Timings
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 Sat. No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	16	157		31	133	0		80	34	45	50	
Queue Length 95th (ft)	37	#326		62	#248	0		#170	92	89	109	
Internal Link Dist (ft)		927			625			148			615	
Turn Bay Length (ft)	110			130		215				125		
Base Capacity (vph)	688	479		429	676	949		344	855	323	750	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.10	0.83		0.30	0.51	0.07		0.60	0.44	0.49	0.35	

Intersection Summary

Area Type: Other

Cycle Length: 71.5

Actuated Cycle Length: 65.1

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 22.6

Intersection LOS: C

Intersection Capacity Utilization 69.9%

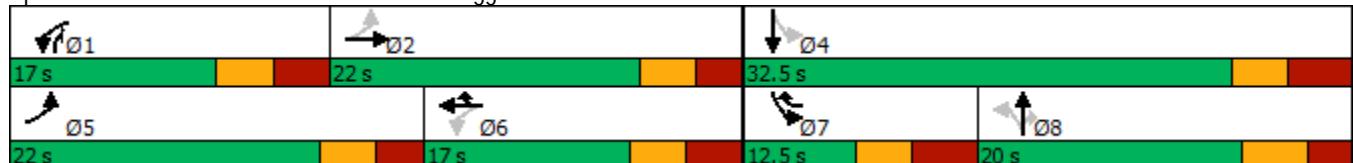
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Belleville Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 Sat. No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑		↑	↑	↑	↓	
Traffic Volume (veh/h)	65	298	66	119	318	61	43	145	343	145	115	123
Future Volume (veh/h)	65	298	66	119	318	61	43	145	343	145	115	123
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	324	72	129	346	66	47	158	373	158	125	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	326	365	81	288	504	570	120	301	461	360	327	350
Arrive On Green	0.07	0.25	0.25	0.08	0.27	0.27	0.21	0.21	0.21	0.09	0.40	0.40
Sat Flow, veh/h	1781	1482	329	1781	1870	1585	258	1440	1585	1781	826	885
Grp Volume(v), veh/h	71	0	396	129	346	66	205	0	373	158	0	259
Grp Sat Flow(s), veh/h/ln	1781	0	1811	1781	1870	1585	1698	0	1585	1781	0	1711
Q Serve(g_s), s	1.9	0.0	14.1	3.5	11.1	1.9	2.6	0.0	14.0	4.4	0.0	7.2
Cycle Q Clear(g_c), s	1.9	0.0	14.1	3.5	11.1	1.9	6.9	0.0	14.0	4.4	0.0	7.2
Prop In Lane	1.00		0.18	1.00		1.00	0.23		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	326	0	446	288	504	570	421	0	461	360	0	677
V/C Ratio(X)	0.22	0.00	0.89	0.45	0.69	0.12	0.49	0.00	0.81	0.44	0.00	0.38
Avail Cap(c_a), veh/h	648	0	446	435	504	570	421	0	461	360	0	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	24.3	18.0	21.9	14.3	23.6	0.0	22.0	17.3	0.0	14.4
Incr Delay (d2), s/veh	0.3	0.0	22.1	1.1	7.4	0.4	0.9	0.0	10.4	0.8	0.0	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.8	0.0	8.4	1.4	5.6	0.7	2.8	0.0	6.4	1.7	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.6	0.0	46.4	19.1	29.3	14.8	24.4	0.0	32.5	18.1	0.0	14.8
LnGrp LOS	B	A	D	B	C	B	C	A	C	B	A	B
Approach Vol, veh/h	467				541			578			417	
Approach Delay, s/veh	42.0				25.1			29.6			16.0	
Approach LOS	D				C			C			B	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	22.5		33.0	9.9	24.1	12.5	20.5				
Change Period (Y+Rc), s	6.0	* 6		6.5	5.5	6.0	6.5	* 6.5				
Max Green Setting (Gmax), s	11.0	* 17		26.0	16.5	11.0	6.0	* 14				
Max Q Clear Time (g_c+l1), s	5.5	16.1		9.2	3.9	13.1	6.4	16.0				
Green Ext Time (p_c), s	0.2	0.1		0.9	0.1	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				28.5								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Lanes, Volumes, Timings

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street 2027 Sat. No Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↔		↑	↑	↑			
Traffic Volume (vph)	71	247	0	0	353	75	103	296	178	0	0	0
Future Volume (vph)	71	247	0	0	353	75	103	296	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0	0	0
Storage Lanes	1		0	0		0	1		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
Fr _t					0.976				0.850			
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	1863	0	0	1818	0	1770	1863	1583	0	0	0
Flt Permitted	0.299						0.950					
Satd. Flow (perm)	557	1863	0	0	1818	0	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12				193			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		482			1007			248			274	
Travel Time (s)		11.0			22.9			5.6			6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	268	0	0	384	82	112	322	193	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	268	0	0	466	0	112	322	193	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Prot			
Protected Phases	5	2			6			8	8			
Permitted Phases	2						8					
Detector Phase	5	2			6		8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0	5.0			
Minimum Split (s)	9.5	22.5			22.5		22.5	22.5	22.5			
Total Split (s)	27.0	55.0			28.0		35.0	35.0	35.0			
Total Split (%)	30.0%	61.1%			31.1%		38.9%	38.9%	38.9%			
Maximum Green (s)	22.5	50.5			23.5		30.5	30.5	30.5			
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5			
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	0.0	0.0			
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max		Max	Max	Max			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		11.0			11.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	50.5	50.5			40.7		30.5	30.5	30.5			
Actuated g/C Ratio	0.56	0.56			0.45		0.34	0.34	0.34			
v/c Ratio	0.19	0.26			0.56		0.19	0.51	0.29			
Control Delay	9.9	11.8			22.0		22.1	27.3	4.6			
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0			
Total Delay	9.9	11.8			22.0		22.1	27.3	4.6			

Lanes, Volumes, Timings

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

2027 Sat. No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B			C		C	C	A			
Approach Delay		11.4			22.0				19.4			
Approach LOS			B		C				B			
Queue Length 50th (ft)	24	91			191		44	145	0			
Queue Length 95th (ft)	50	142			303		84	226	44			
Internal Link Dist (ft)		402			927			168				194
Turn Bay Length (ft)		150										
Base Capacity (vph)	615	1045			829		599	631	664			
Starvation Cap Reductn	0	0			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.13	0.26			0.56		0.19	0.51	0.29			

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 18.3

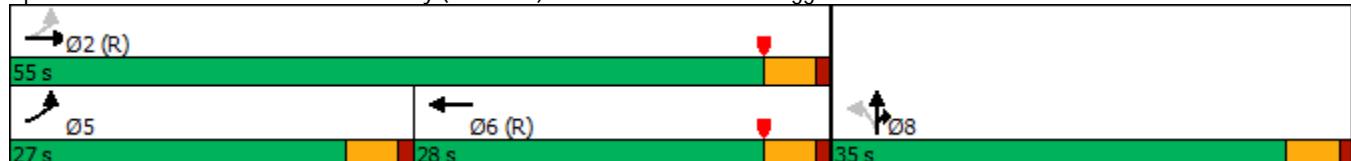
Intersection LOS: B

Intersection Capacity Utilization 54.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street

2027 Sat. No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	247	0	0	353	75	103	296	178	0	0	0
Future Volume (veh/h)	71	247	0	0	353	75	103	296	178	0	0	0
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	77	268	0	0	384	82	112	322	193			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	422	1049	0	0	693	148	604	634	537			
Arrive On Green	0.02	0.19	0.00	0.00	0.46	0.46	0.34	0.34	0.34			
Sat Flow, veh/h	1781	1870	0	0	1494	319	1781	1870	1585			
Grp Volume(v), veh/h	77	268	0	0	0	466	112	322	193			
Grp Sat Flow(s), veh/h/ln	1781	1870	0	0	0	1813	1781	1870	1585			
Q Serve(g_s), s	1.9	11.0	0.0	0.0	0.0	16.7	4.0	12.4	8.2			
Cycle Q Clear(g_c), s	1.9	11.0	0.0	0.0	0.0	16.7	4.0	12.4	8.2			
Prop In Lane	1.00		0.00	0.00		0.18	1.00		1.00			
Lane Grp Cap(c), veh/h	422	1049	0	0	0	841	604	634	537			
V/C Ratio(X)	0.18	0.26	0.00	0.00	0.00	0.55	0.19	0.51	0.36			
Avail Cap(c_a), veh/h	783	1049	0	0	0	841	604	634	537			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.98	0.98	0.00	0.00	0.00	0.85	1.00	1.00	1.00			
Uniform Delay (d), s/veh	12.8	20.6	0.0	0.0	0.0	17.4	21.0	23.8	22.4			
Incr Delay (d2), s/veh	0.2	0.6	0.0	0.0	0.0	2.2	0.7	2.9	1.9			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.8	5.6	0.0	0.0	0.0	7.1	1.7	5.8	3.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.0	21.2	0.0	0.0	0.0	19.7	21.7	26.7	24.3			
LnGrp LOS	B	C	A	A	A	B	C	C	C			
Approach Vol, veh/h		345			466			627				
Approach Delay, s/veh		19.3			19.7			25.0				
Approach LOS		B			B			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+R _c), s		55.0			8.8	46.2		35.0				
Change Period (Y+R _c), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			22.5	23.5		30.5				
Max Q Clear Time (g_c+l1), s		13.0			3.9	18.7		14.4				
Green Ext Time (p_c), s		1.1			0.2	0.9		2.4				
Intersection Summary												
HCM 6th Ctrl Delay		21.9										
HCM 6th LOS			C									

Lanes, Volumes, Timings

5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street

2027 Sat. No Build Condition

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	213	68	210	227	0	0	0	0	92	482	31
Future Volume (vph)	0	213	68	210	227	0	0	0	0	92	482	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0	0	0
Storage Lanes	0		1	1		0	0		0	1		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	0.95	0.95
Fr _t				0.850								0.991
Flt Protected					0.950						0.950	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	1770	3507	0
Flt Permitted					0.535						0.950	
Satd. Flow (perm)	0	1863	1583	997	1863	0	0	0	0	1770	3507	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74									8
Link Speed (mph)		30			30			30				30
Link Distance (ft)		423			482			267				255
Travel Time (s)		9.6			11.0			6.1				5.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	232	74	228	247	0	0	0	0	100	524	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	232	74	228	247	0	0	0	0	100	558	0
Turn Type		NA	Prot	pm+pt		NA					Split	NA
Protected Phases		2	2	1	6						4	4
Permitted Phases				6								
Detector Phase		2	2	1	6						4	4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Minimum Split (s)		22.5	22.5	9.5	22.5					22.5	22.5	
Total Split (s)		30.0	30.0	21.0	51.0					39.0	39.0	
Total Split (%)		33.3%	33.3%	23.3%	56.7%					43.3%	43.3%	
Maximum Green (s)		25.5	25.5	16.5	46.5					34.5	34.5	
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5	3.5	
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					0.0	0.0	
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Recall Mode		C-Max	C-Max	None	C-Max					None	None	
Walk Time (s)		7.0	7.0		7.0							
Flash Dont Walk (s)		11.0	11.0		11.0							
Pedestrian Calls (#/hr)		0	0		0							
Act Effct Green (s)		46.1	46.1	60.7	60.7					20.3	20.3	
Actuated g/C Ratio		0.51	0.51	0.67	0.67					0.23	0.23	
v/c Ratio		0.24	0.09	0.30	0.20					0.25	0.70	
Control Delay		14.8	4.4	8.3	7.7					28.9	36.2	
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		14.8	4.4	8.3	7.7					28.9	36.2	

Lanes, Volumes, Timings

5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street

2027 Sat. No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	A	A	A						C	D	
Approach Delay		12.3			8.0						35.1	
Approach LOS		B			A						D	
Queue Length 50th (ft)	70	0	82	90						47	151	
Queue Length 95th (ft)	143	25	131	142						83	191	
Internal Link Dist (ft)	343			402			187				175	
Turn Bay Length (ft)			200									
Base Capacity (vph)	954	847	814	1257						678	1349	
Starvation Cap Reductn	0	0	0	0						0	0	
Spillback Cap Reductn	0	0	0	0						0	0	
Storage Cap Reductn	0	0	0	0						0	0	
Reduced v/c Ratio	0.24	0.09	0.28	0.20						0.15	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 49 (54%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 21.3

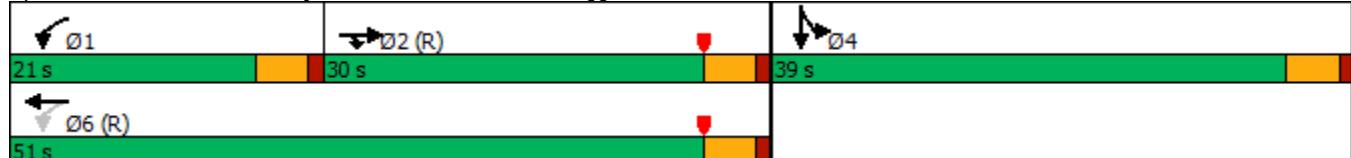
Intersection LOS: C

Intersection Capacity Utilization 54.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Ashley Boulevard (Route 18) & Coggeshall Street



HCM 6th Signalized Intersection Summary
5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street
2027 Sat. No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	213	68	210	227	0	0	0	0	92	482	31
Future Volume (veh/h)	0	213	68	210	227	0	0	0	0	92	482	31
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	232	74	228	247	0				100	524	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1072	908	772	1314	0				352	669	43
Arrive On Green	0.00	0.57	0.57	0.16	1.00	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1870	1585	1781	1870	0				1781	3388	219
Grp Volume(v), veh/h	0	232	74	228	247	0				100	274	284
Grp Sat Flow(s), veh/h/ln	0	1870	1585	1781	1870	0				1781	1777	1831
Q Serve(g_s), s	0.0	5.4	1.9	4.6	0.0	0.0				4.3	13.2	13.2
Cycle Q Clear(g_c), s	0.0	5.4	1.9	4.6	0.0	0.0				4.3	13.2	13.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.12
Lane Grp Cap(c), veh/h	0	1072	908	772	1314	0				352	351	362
V/C Ratio(X)	0.00	0.22	0.08	0.30	0.19	0.00				0.28	0.78	0.78
Avail Cap(c_a), veh/h	0	1072	908	957	1314	0				683	681	702
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.87	0.87	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.4	8.6	5.4	0.0	0.0				30.7	34.3	34.3
Incr Delay (d2), s/veh	0.0	0.5	0.2	0.2	0.3	0.0				0.4	3.8	3.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	2.2	0.6	1.3	0.1	0.0				1.9	5.9	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	9.8	8.8	5.6	0.3	0.0				31.1	38.1	38.1
LnGrp LOS	A	A	A	A	A	A				C	D	D
Approach Vol, veh/h		306			475						658	
Approach Delay, s/veh		9.6			2.8						37.0	
Approach LOS		A			A						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+R _c), s	11.7	56.1		22.3		67.7						
Change Period (Y+R _c), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	16.5	25.5		34.5		46.5						
Max Q Clear Time (g_c+l1), s	6.6	7.4		15.2		2.0						
Green Ext Time (p_c), s	0.6	1.1		2.5		1.0						
Intersection Summary												
HCM 6th Ctrl Delay			19.9									
HCM 6th LOS			B									

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 Sat. No Build Condition

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	113	51	9	99	237	18	271	15	241	329	72
Future Volume (vph)	21	113	51	9	99	237	18	271	15	241	329	72
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		0.963			0.907			0.993			0.985	
Flt Protected		0.994			0.999			0.997			0.982	
Satd. Flow (prot)	0	1783	0	0	1688	0	0	1844	0	0	1802	0
Flt Permitted		0.746			0.989			0.937			0.583	
Satd. Flow (perm)	0	1338	0	0	1671	0	0	1733	0	0	1070	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			161			5			20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		608			1839			695			734	
Travel Time (s)		13.8			41.8			15.8			16.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	123	55	10	108	258	20	295	16	262	358	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	201	0	0	376	0	0	331	0	0	698	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2		1	1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	1	6
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0		6.0		
Minimum Split (s)	16.0	16.0		16.0	16.0		26.0	26.0		12.0		
Total Split (s)	17.0	17.0		17.0	17.0		26.0	26.0		17.0		
Total Split (%)	28.3%	28.3%		28.3%	28.3%		43.3%	43.3%		28.3%		
Maximum Green (s)	11.0	11.0		11.0	11.0		20.0	20.0		11.0		
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2		3.2		
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.8		2.8		
Lost Time Adjust (s)		0.0		0.0			0.0					
Total Lost Time (s)		6.0		6.0			6.0					
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		
Recall Mode	None	None		None	None		Max	Max		None		
Act Effct Green (s)		10.8			10.8			20.0			37.0	
Actuated g/C Ratio		0.18			0.18			0.33			0.62	
v/c Ratio		0.76			0.87			0.57			0.87	
Control Delay		41.4			36.9			20.8			22.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		41.4			36.9			20.8			22.3	
LOS		D			D			C			C	
Approach Delay		41.4			36.9			20.8			22.3	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		60			74			95			129	
Queue Length 95th (ft)		#156			#215			167			#334	
Internal Link Dist (ft)		528			1759			615			654	

Lane Group	Ø6
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
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	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	20.0
Minimum Split (s)	26.0
Total Split (s)	43.0
Total Split (%)	72%
Maximum Green (s)	37.0
Yellow Time (s)	3.2
All-Red Time (s)	2.8
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 Sat. No Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	269			438			583			804		
Starvation Cap Reductn	0			0			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.75			0.86			0.57			0.87		

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 59.8

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 27.8

Intersection LOS: C

Intersection Capacity Utilization 88.3%

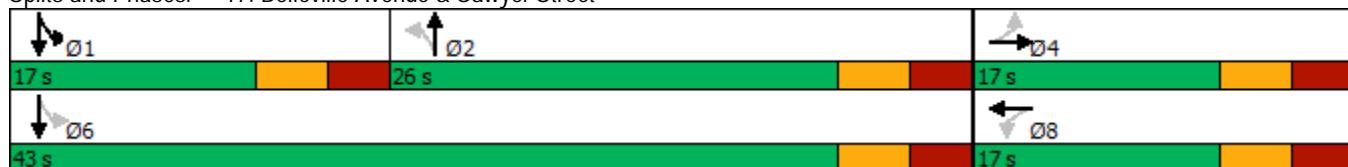
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: Belleville Avenue & Sawyer Street



Lane Group	Ø6
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 Sat. No Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	113	51	9	99	237	18	271	15	241	329	72
Future Volume (vph)	21	113	51	9	99	237	18	271	15	241	329	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												6.0
Lane Util. Factor		1.00				1.00			1.00			1.00
Frt		0.96				0.91			0.99			0.98
Flt Protected		0.99				1.00			1.00			0.98
Satd. Flow (prot)		1784				1688			1845			1801
Flt Permitted		0.75				0.99			0.94			0.58
Satd. Flow (perm)		1338				1671			1733			1070
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	123	55	10	108	258	20	295	16	262	358	78
RTOR Reduction (vph)	0	23	0	0	132	0	0	3	0	0	8	0
Lane Group Flow (vph)	0	178	0	0	244	0	0	328	0	0	690	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4				8			2		1	1 6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.8				10.8			20.0			37.0
Effective Green, g (s)		10.8				10.8			20.0			37.0
Actuated g/C Ratio		0.18				0.18			0.33			0.62
Clearance Time (s)		6.0				6.0			6.0			
Vehicle Extension (s)		3.0				3.0			3.0			
Lane Grp Cap (vph)		241				301			579			796
v/s Ratio Prot												c0.16
v/s Ratio Perm		0.13				c0.15			0.19			c0.38
v/c Ratio		0.74				0.81			0.57			0.87
Uniform Delay, d1		23.2				23.5			16.3			9.4
Progression Factor		1.00				1.00			1.00			1.00
Incremental Delay, d2		11.2				15.1			4.0			9.8
Delay (s)		34.4				38.7			20.3			19.2
Level of Service		C				D			C			B
Approach Delay (s)		34.4				38.7			20.3			19.2
Approach LOS		C				D			C			B
Intersection Summary												
HCM 2000 Control Delay		25.9				HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		59.8				Sum of lost time (s)			18.0			
Intersection Capacity Utilization		88.3%				ICU Level of Service			E			
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street 2027 Saturday Build Condition

Lane Group	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	320	195	257	178	125	116	110	28	166	174	77
Future Volume (vph)	105	320	195	257	178	125	116	110	28	166	174	77
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	0.95	1.00	1.00	1.00
Frt				0.850		0.938			0.970			0.850
Flt Protected	0.950				0.950			0.950			0.950	
Satd. Flow (prot)	1770	1863	1583	1770	1747	0	1770	3433	0	1770	1863	1583
Flt Permitted	0.528				0.368			0.601			0.950	
Satd. Flow (perm)	984	1863	1583	685	1747	0	1120	3433	0	1770	1863	1583
Right Turn on Red			Yes				Yes			Yes		Yes
Satd. Flow (RTOR)						43			28			84
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		390			460			227			299	
Travel Time (s)		8.9			10.5			5.2			6.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	348	212	279	193	136	126	120	30	180	189	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	348	212	279	329	0	126	150	0	180	189	84
Turn Type	pm+pt	NA	custom	pm+pt	NA		pm+pt	NA		Prot	NA	pt+ov
Protected Phases	5	2	2	1	6		3	8		7	4	45
Permitted Phases	2	1	3	4	5		8					
Detector Phase	5	2	2	1	6		3	8		7	4	45
Switch Phase												
Minimum Initial (s)	6.0	10.0	10.0	6.0	10.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	10.5	22.5	22.5	10.5	22.5		10.5	10.5		10.5	10.5	
Total Split (s)	25.0	35.0	35.0	25.0	35.0		15.0	15.0		15.0	15.0	
Total Split (%)	27.8%	38.9%	38.9%	27.8%	38.9%		16.7%	16.7%		16.7%	16.7%	
Maximum Green (s)	20.5	30.5	30.5	20.5	30.5		10.5	10.5		10.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5		3.5	3.5	
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		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max	Max	None	Max		None	None		None	None	
Act Effct Green (s)	38.4	30.6	79.8	46.0	34.6		17.9	8.9		10.5	12.8	25.1
Actuated g/C Ratio	0.48	0.38	1.00	0.58	0.43		0.22	0.11		0.13	0.16	0.31
v/c Ratio	0.21	0.49	0.13	0.50	0.42		0.39	0.37		0.78	0.63	0.15
Control Delay	9.1	22.5	0.2	11.7	16.0		25.7	29.7		59.0	46.0	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	9.1	22.5	0.2	11.7	16.0		25.7	29.7		59.0	46.0	6.4
LOS	A	C	A	B	B		C	C		E	D	A
Approach Delay		13.2			14.0			27.9			43.8	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	23	130	0	63	95		47	30		89	93	0
Queue Length 95th (ft)	46	228	0	106	172		95	60		#206	#212	32
Internal Link Dist (ft)		310			380			147			219	

Lanes, Volumes, Timings

Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street 2027 Saturday Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	780	714	1583	682	780		358	477		233	298	795
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.15	0.49	0.13	0.41	0.42		0.35	0.31		0.77	0.63	0.11

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 79.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 22.4

Intersection LOS: C

Intersection Capacity Utilization 61.7%

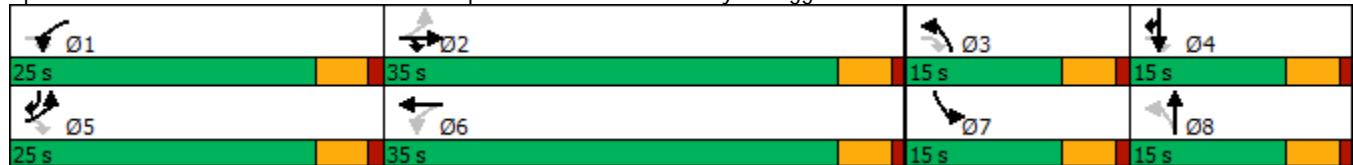
ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street



HCM 6th Signalized Intersection Summary

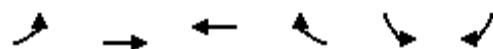
Coggeshall Street

1: I-195 WB Exit 17 Ramps/Veterans Memorial Way & Coggeshall Street 2027 Saturday Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	105	320	195	257	178	125	116	110	28	166	174	77
Future Volume (veh/h)	105	320	195	257	178	125	116	110	28	166	174	77
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No	No		No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	348	0	279	193	136	126	120	30	180	189	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	590	781		611	476	335	284	254	62	220	239	320
Arrive On Green	0.07	0.42	0.00	0.12	0.47	0.47	0.09	0.09	0.09	0.12	0.13	0.13
Sat Flow, veh/h	1781	1870	1585	1781	1021	720	1781	2836	688	1781	1870	1585
Grp Volume(v), veh/h	114	348	0	279	0	329	126	74	76	180	189	84
Grp Sat Flow(s), veh/h/ln	1781	1870	1585	1781	0	1741	1781	1777	1747	1781	1870	1585
Q Serve(g_s), s	2.5	9.7	0.0	6.0	0.0	9.1	4.6	2.9	3.0	7.2	7.2	3.3
Cycle Q Clear(g_c), s	2.5	9.7	0.0	6.0	0.0	9.1	4.6	2.9	3.0	7.2	7.2	3.3
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	590	781		611	0	811	284	159	157	220	239	320
V/C Ratio(X)	0.19	0.45		0.46	0.00	0.41	0.44	0.46	0.46	0.82	0.79	0.26
Avail Cap(c_a), veh/h	958	781		892	0	811	387	255	251	256	269	345
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.3	15.2	0.0	9.7	0.0	12.8	26.9	31.6	31.6	31.2	30.9	24.6
Incr Delay (d2), s/veh	0.2	1.8	0.0	0.5	0.0	1.5	1.1	2.1	2.3	16.2	13.4	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.9	4.2	0.0	2.1	0.0	3.6	2.0	1.3	1.3	4.0	4.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	10.5	17.1	0.0	10.2	0.0	14.3	28.0	33.7	34.0	47.4	44.3	25.0
LnGrp LOS	B	B		B	A	B	C	C	C	D	D	C
Approach Vol, veh/h		462	A		608			276			453	
Approach Delay, s/veh		15.4			12.4			31.1			42.0	
Approach LOS		B			B			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	35.0	10.8	13.8	9.9	38.5	13.5	11.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	20.5	30.5	10.5	10.5	20.5	30.5	10.5	10.5				
Max Q Clear Time (g_c+l1), s	8.0	11.7	6.6	9.2	4.5	11.1	9.2	5.0				
Green Ext Time (p_c), s	0.9	2.8	0.2	0.2	0.6	1.4	0.1	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.5									
HCM 6th LOS			C									
Notes												
User approved pedestrian interval to be less than phase max green.												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

Lanes, Volumes, Timings
2: Coggeshall Street & Site Driveway

Coggeshall Street
2027 Saturday Build Condition



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↑	↑	↑		↑	
Traffic Volume (vph)	101	571	340	39	18	89
Future Volume (vph)	101	571	340	39	18	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	0	0
Storage Lanes	1			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.986			0.865
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1837	0	0	1611
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1837	0	0	1611
Link Speed (mph)		30	30		30	
Link Distance (ft)		705	390		266	
Travel Time (s)		16.0	8.9		6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	110	621	370	42	20	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	110	621	412	0	20	97
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

Intersection

Int Delay, s/veh 1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↗	
Traffic Vol, veh/h	101	571	340	39	18	89
Future Vol, veh/h	101	571	340	39	18	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	621	370	42	20	97

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	412	0	-	0	1232	391
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	841	-
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	1147	-	-	-	196	658
Stage 1	-	-	-	-	683	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1147	-	-	-	177	658
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	423	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	11.4
HCM LOS		B	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1147	-	-	-	658
HCM Lane V/C Ratio	0.096	-	-	-	0.147
HCM Control Delay (s)	8.5	-	-	-	11.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5

Lanes, Volumes, Timings
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 Saturday Build Condition

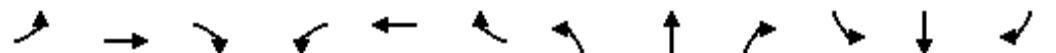
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↓		↑	↑	↑		↑	↑	↑	↓	
Traffic Volume (vph)	65	321	66	142	341	61	43	145	366	145	115	123
Future Volume (vph)	65	321	66	142	341	61	43	145	366	145	115	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	130		215	0		0	125		0
Storage Lanes	1		0	1		1	0		1	1		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		0.974				0.850			0.850		0.922	
Flt Protected	0.950			0.950				0.989		0.950		
Satd. Flow (prot)	1770	1814	0	1770	1863	1583	0	1842	1583	1770	1717	0
Flt Permitted	0.504			0.183				0.844		0.358		
Satd. Flow (perm)	939	1814	0	341	1863	1583	0	1572	1583	667	1717	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			145				227		85	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1007			705			228			695	
Travel Time (s)		22.9			16.0			5.2			15.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	349	72	154	371	66	47	158	398	158	125	134
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	421	0	154	371	66	0	205	398	158	259	0
Turn Type	pm+pt	NA		pm+pt	NA	pt+ov	Perm	NA	pm+ov	pm+pt	NA	
Protected Phases	5	2		1	6	6 7		8	1	7	4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6	6 7	8	8	1	7	4	
Switch Phase												
Minimum Initial (s)	6.0	10.0		6.0	10.0		6.0	6.0	6.0	6.0	6.0	
Minimum Split (s)	11.5	15.5		12.0	16.0		12.0	12.0	12.0	12.5	12.5	
Total Split (s)	22.0	22.0		17.0	17.0		20.0	20.0	17.0	12.5	32.5	
Total Split (%)	30.8%	30.8%		23.8%	23.8%		28.0%	28.0%	23.8%	17.5%	45.5%	
Maximum Green (s)	16.5	16.5		11.0	11.0		14.0	14.0	11.0	6.0	26.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.5	3.5	3.0	3.0	3.0	
All-Red Time (s)	2.5	2.5		3.0	3.0		2.5	2.5	3.0	3.5	3.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.5		6.0	6.0			6.0	6.0	6.5	6.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lead	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	Max		None	Max		None	None	None	None	None	
Act Effct Green (s)	23.7	16.6		29.3	23.3	35.9		12.4	27.4	24.4	24.4	
Actuated g/C Ratio	0.35	0.24		0.43	0.34	0.53		0.18	0.40	0.36	0.36	
v/c Ratio	0.17	0.93		0.46	0.58	0.07		0.72	0.52	0.47	0.39	
Control Delay	12.2	56.8		16.3	26.3	0.2		42.0	8.8	20.8	12.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	12.2	56.8		16.3	26.3	0.2		42.0	8.8	20.8	12.8	
LOS	B	E		B	C	A		D	A	C	B	
Approach Delay		50.4			20.8			20.1		15.8		
Approach LOS		D			C			C		B		

Lanes, Volumes, Timings

3: Belleville Avenue & Coggeshall Street

Coggeshall Street

2027 Saturday Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	16	173		38	145	0		81	46	45	51	
Queue Length 95th (ft)	37	#355		72	#276	0		#170	113	89	109	
Internal Link Dist (ft)		927			625			148			615	
Turn Bay Length (ft)	110			130		215				125		
Base Capacity (vph)	635	452		380	638	903		324	814	337	711	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.11	0.93		0.41	0.58	0.07		0.63	0.49	0.47	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 71.5

Actuated Cycle Length: 68

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 26.5

Intersection LOS: C

Intersection Capacity Utilization 72.4%

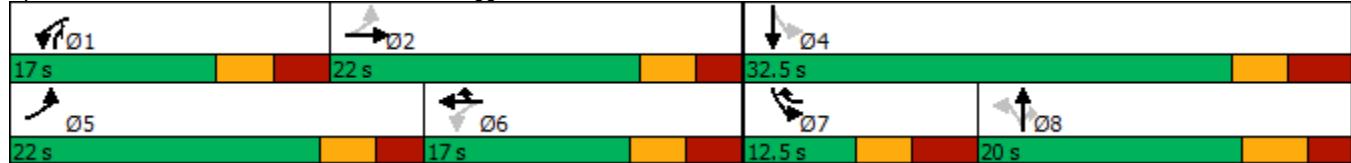
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: Belleville Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary
3: Belleville Avenue & Coggeshall Street

Coggeshall Street
2027 Saturday Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑ ↗	↑ ↘		↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘	↑ ↗	↑ ↘	
Traffic Volume (veh/h)	65	321	66	142	341	61	43	145	366	145	115	123
Future Volume (veh/h)	65	321	66	142	341	61	43	145	366	145	115	123
Initial Q (Q _b), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	349	72	154	371	66	47	158	398	158	125	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	367	76	282	517	579	119	298	471	353	324	347
Arrive On Green	0.07	0.24	0.24	0.09	0.28	0.28	0.21	0.21	0.21	0.09	0.39	0.39
Sat Flow, veh/h	1781	1504	310	1781	1870	1585	259	1438	1585	1781	826	885
Grp Volume(v), veh/h	71	0	421	154	371	66	205	0	398	158	0	259
Grp Sat Flow(s), veh/h/ln	1781	0	1815	1781	1870	1585	1697	0	1585	1781	0	1711
Q Serve(g_s), s	1.9	0.0	15.4	4.3	12.1	1.9	2.8	0.0	14.0	4.4	0.0	7.3
Cycle Q Clear(g_c), s	1.9	0.0	15.4	4.3	12.1	1.9	7.0	0.0	14.0	4.4	0.0	7.3
Prop In Lane	1.00		0.17	1.00		1.00	0.23		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	316	0	443	282	517	579	417	0	471	353	0	671
V/C Ratio(X)	0.23	0.00	0.95	0.55	0.72	0.11	0.49	0.00	0.84	0.45	0.00	0.39
Avail Cap(c_a), veh/h	634	0	443	412	517	579	417	0	471	353	0	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	0.0	25.1	18.4	22.1	14.2	23.9	0.0	22.3	17.6	0.0	14.7
Incr Delay (d2), s/veh	0.4	0.0	32.0	1.6	8.3	0.4	0.9	0.0	13.2	0.9	0.0	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.8	0.0	10.1	1.7	6.2	0.7	2.9	0.0	7.2	1.8	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.9	0.0	57.2	20.0	30.4	14.6	24.8	0.0	35.5	18.5	0.0	15.1
LnGrp LOS	B	A	E	B	C	B	C	A	D	B	A	B
Approach Vol, veh/h					591				603			417
Approach Delay, s/veh					25.9				31.9			16.4
Approach LOS				D		C		C				B
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	22.5		33.0	9.9	24.7	12.5	20.5				
Change Period (Y+Rc), s	6.0	* 6		6.5	5.5	6.0	6.5	* 6.5				
Max Green Setting (Gmax), s	11.0	* 17		26.0	16.5	11.0	6.0	* 14				
Max Q Clear Time (g_c+l1), s	6.3	17.4		9.3	3.9	14.1	6.4	16.0				
Green Ext Time (p_c), s	0.2	0.0		0.9	0.1	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay				31.7								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Lanes, Volumes, Timings

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street 2027 Saturday Build Condition

	→	→	→	←	←	↑	↑	↑	↓	↓	←	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑			↑		↑	↑	↑			
Traffic Volume (vph)	71	256	0	0	376	75	103	296	192	0	0	0
Future Volume (vph)	71	256	0	0	376	75	103	296	192	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0	0	0
Storage Lanes	1		0	0		0	1		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
Fr _t					0.977				0.850			
Flt Protected	0.950					0.950						
Satd. Flow (prot)	1770	1863	0	0	1820	0	1770	1863	1583	0	0	0
Flt Permitted	0.278					0.950						
Satd. Flow (perm)	518	1863	0	0	1820	0	1770	1863	1583	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11				209			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		482			1007			248			274	
Travel Time (s)		11.0			22.9			5.6			6.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	278	0	0	409	82	112	322	209	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	77	278	0	0	491	0	112	322	209	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA	Prot			
Protected Phases	5	2			6			8	8			
Permitted Phases	2						8					
Detector Phase	5	2			6		8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	5.0			5.0		5.0	5.0	5.0			
Minimum Split (s)	9.5	22.5			22.5		22.5	22.5	22.5			
Total Split (s)	27.0	55.0			28.0		35.0	35.0	35.0			
Total Split (%)	30.0%	61.1%			31.1%		38.9%	38.9%	38.9%			
Maximum Green (s)	22.5	50.5			23.5		30.5	30.5	30.5			
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5			
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	0.0	0.0			
Total Lost Time (s)	4.5	4.5			4.5		4.5	4.5	4.5			
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Recall Mode	None	C-Max			C-Max		Max	Max	Max			
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		11.0			11.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	50.5	50.5			40.7		30.5	30.5	30.5			
Actuated g/C Ratio	0.56	0.56			0.45		0.34	0.34	0.34			
v/c Ratio	0.20	0.27			0.59		0.19	0.51	0.31			
Control Delay	9.9	11.9			22.8		22.1	27.3	4.5			
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0			
Total Delay	9.9	11.9			22.8		22.1	27.3	4.5			

Lanes, Volumes, Timings

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street 2027 Saturday Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	B			C		C	C	A			
Approach Delay		11.4			22.8				19.0			
Approach LOS			B		C				B			
Queue Length 50th (ft)	24	96			206		44	145	0			
Queue Length 95th (ft)	50	149			325		84	226	46			
Internal Link Dist (ft)		402			927			168				194
Turn Bay Length (ft)		150										
Base Capacity (vph)	603	1045			829		599	631	674			
Starvation Cap Reductn	0	0			0		0	0	0			
Spillback Cap Reductn	0	0			0		0	0	0			
Storage Cap Reductn	0	0			0		0	0	0			
Reduced v/c Ratio	0.13	0.27			0.59		0.19	0.51	0.31			

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 18.4

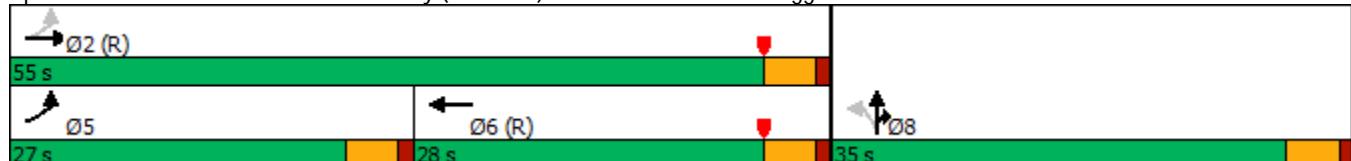
Intersection LOS: B

Intersection Capacity Utilization 55.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street



HCM 6th Signalized Intersection Summary

Coggeshall Street

4: JFK Memorial Hwy (Route 18)/Achushnet Avenue & Coggeshall Street 2027 Saturday Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	256	0	0	376	75	103	296	192	0	0	0
Future Volume (veh/h)	71	256	0	0	376	75	103	296	192	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	77	278	0	0	409	82	112	322	209			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	404	1049	0	0	701	141	604	634	537			
Arrive On Green	0.02	0.19	0.00	0.00	0.46	0.46	0.34	0.34	0.34			
Sat Flow, veh/h	1781	1870	0	0	1513	303	1781	1870	1585			
Grp Volume(v), veh/h	77	278	0	0	0	491	112	322	209			
Grp Sat Flow(s), veh/h/ln	1781	1870	0	0	0	1816	1781	1870	1585			
Q Serve(g_s), s	1.9	11.5	0.0	0.0	0.0	17.9	4.0	12.4	9.0			
Cycle Q Clear(g_c), s	1.9	11.5	0.0	0.0	0.0	17.9	4.0	12.4	9.0			
Prop In Lane	1.00		0.00	0.00		0.17	1.00		1.00			
Lane Grp Cap(c), veh/h	404	1049	0	0	0	842	604	634	537			
V/C Ratio(X)	0.19	0.26	0.00	0.00	0.00	0.58	0.19	0.51	0.39			
Avail Cap(c_a), veh/h	765	1049	0	0	0	842	604	634	537			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(l)	0.98	0.98	0.00	0.00	0.00	0.79	1.00	1.00	1.00			
Uniform Delay (d), s/veh	13.1	20.8	0.0	0.0	0.0	17.7	21.0	23.8	22.7			
Incr Delay (d2), s/veh	0.2	0.6	0.0	0.0	0.0	2.3	0.7	2.9	2.1			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln	0.8	5.9	0.0	0.0	0.0	7.6	1.7	5.8	3.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.3	21.4	0.0	0.0	0.0	20.1	21.7	26.7	24.8			
LnGrp LOS	B	C	A	A	A	C	C	C	C			
Approach Vol, veh/h		355			491			643				
Approach Delay, s/veh		19.6			20.1			25.2				
Approach LOS		B			C			C				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		55.0			8.8	46.2		35.0				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		50.5			22.5	23.5		30.5				
Max Q Clear Time (g_c+l1), s		13.5			3.9	19.9		14.4				
Green Ext Time (p_c), s		1.1			0.2	0.8		2.4				
Intersection Summary												
HCM 6th Ctrl Delay		22.2										
HCM 6th LOS			C									

Lanes, Volumes, Timings

Coggeshall Street

5: Ashley Boulevard (Route 18) & Coggeshall Street

2027 Saturday Build Condition

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑	↑	↑					↑	↑↑	
Traffic Volume (vph)	0	222	68	224	236	0	0	0	0	92	482	31
Future Volume (vph)	0	222	68	224	236	0	0	0	0	92	482	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	200		0	0		0	0	0	0
Storage Lanes	0		1	1		0	0		0	1		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	0.95	0.95
Fr _t				0.850								0.991
Flt Protected					0.950						0.950	
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	1770	3507	0
Flt Permitted					0.526						0.950	
Satd. Flow (perm)	0	1863	1583	980	1863	0	0	0	0	1770	3507	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			74									8
Link Speed (mph)		30			30			30				30
Link Distance (ft)		423			482			267				255
Travel Time (s)		9.6			11.0			6.1				5.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	241	74	243	257	0	0	0	0	100	524	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	241	74	243	257	0	0	0	0	100	558	0
Turn Type		NA	Prot	pm+pt		NA				Split		NA
Protected Phases		2	2	1	6					4		4
Permitted Phases				6								
Detector Phase		2	2	1	6					4		4
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0					5.0		5.0
Minimum Split (s)		22.5	22.5	9.5	22.5					22.5		22.5
Total Split (s)		30.0	30.0	21.0	51.0					39.0		39.0
Total Split (%)		33.3%	33.3%	23.3%	56.7%					43.3%		43.3%
Maximum Green (s)		25.5	25.5	16.5	46.5					34.5		34.5
Yellow Time (s)		3.5	3.5	3.5	3.5					3.5		3.5
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					0.0		0.0
Total Lost Time (s)		4.5	4.5	4.5	4.5					4.5		4.5
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Recall Mode	C-Max	C-Max	None	C-Max						None		None
Walk Time (s)		7.0	7.0		7.0							
Flash Dont Walk (s)		11.0	11.0		11.0							
Pedestrian Calls (#/hr)		0	0		0							
Act Effct Green (s)		45.8	45.8	60.7	60.7					20.3		20.3
Actuated g/C Ratio		0.51	0.51	0.67	0.67					0.23		0.23
v/c Ratio		0.25	0.09	0.32	0.20					0.25		0.70
Control Delay		15.2	4.5	8.4	7.7					28.9		36.2
Queue Delay		0.0	0.0	0.0	0.0					0.0		0.0
Total Delay		15.2	4.5	8.4	7.7					28.9		36.2

Lanes, Volumes, Timings

5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street

2027 Saturday Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B	A	A	A					C	D	
Approach Delay		12.7			8.0						35.1	
Approach LOS		B			A						D	
Queue Length 50th (ft)	73	0	85	91						47	151	
Queue Length 95th (ft)	151	26	136	142						83	191	
Internal Link Dist (ft)	343			402			187				175	
Turn Bay Length (ft)			200									
Base Capacity (vph)	947	841	806	1257						678	1349	
Starvation Cap Reductn	0	0	0	0						0	0	
Spillback Cap Reductn	0	0	0	0						0	0	
Storage Cap Reductn	0	0	0	0						0	0	
Reduced v/c Ratio	0.25	0.09	0.30	0.20						0.15	0.41	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 49 (54%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 21.1

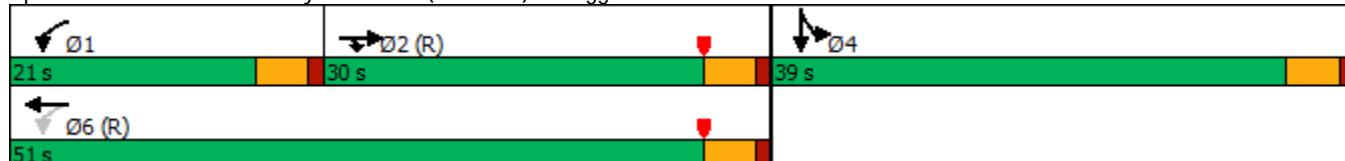
Intersection LOS: C

Intersection Capacity Utilization 55.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 5: Ashley Boulevard (Route 18) & Coggeshall Street



HCM 6th Signalized Intersection Summary
5: Ashley Boulevard (Route 18) & Coggeshall Street

Coggeshall Street
2027 Saturday Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	222	68	224	236	0	0	0	0	92	482	31
Future Volume (veh/h)	0	222	68	224	236	0	0	0	0	92	482	31
Initial Q (Q _b), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	241	74	243	257	0				100	524	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1063	901	767	1314	0				352	669	43
Arrive On Green	0.00	0.57	0.57	0.17	1.00	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1870	1585	1781	1870	0				1781	3388	219
Grp Volume(v), veh/h	0	241	74	243	257	0				100	274	284
Grp Sat Flow(s), veh/h/ln	0	1870	1585	1781	1870	0				1781	1777	1831
Q Serve(g_s), s	0.0	5.7	1.9	5.0	0.0	0.0				4.3	13.2	13.2
Cycle Q Clear(g_c), s	0.0	5.7	1.9	5.0	0.0	0.0				4.3	13.2	13.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		0.12
Lane Grp Cap(c), veh/h	0	1063	901	767	1314	0				352	351	362
V/C Ratio(X)	0.00	0.23	0.08	0.32	0.20	0.00				0.28	0.78	0.78
Avail Cap(c_a), veh/h	0	1063	901	943	1314	0				683	681	702
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	0.84	0.84	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.6	8.8	5.4	0.0	0.0				30.7	34.3	34.3
Incr Delay (d2), s/veh	0.0	0.5	0.2	0.2	0.3	0.0				0.4	3.8	3.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	2.3	0.7	1.4	0.1	0.0				1.9	5.9	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	10.1	9.0	5.6	0.3	0.0				31.1	38.1	38.1
LnGrp LOS	A	B	A	A	A	A				C	D	D
Approach Vol, veh/h		315			500						658	
Approach Delay, s/veh		9.9			2.9						37.0	
Approach LOS		A			A						D	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+R _c), s	12.1	55.6		22.3		67.7						
Change Period (Y+R _c), s	4.5	4.5		4.5		4.5						
Max Green Setting (Gmax), s	16.5	25.5		34.5		46.5						
Max Q Clear Time (g_c+l1), s	7.0	7.7		15.2		2.0						
Green Ext Time (p_c), s	0.6	1.1		2.5		1.0						
Intersection Summary												
HCM 6th Ctrl Delay			19.6									
HCM 6th LOS			B									

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 Saturday Build Condition

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	113	51	9	99	246	18	271	15	250	329	72
Future Volume (vph)	21	113	51	9	99	246	18	271	15	250	329	72
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		0.963			0.906			0.993			0.985	
Flt Protected		0.994			0.999			0.997			0.981	
Satd. Flow (prot)	0	1783	0	0	1686	0	0	1844	0	0	1800	0
Flt Permitted		0.734			0.989			0.936			0.578	
Satd. Flow (perm)	0	1317	0	0	1669	0	0	1731	0	0	1061	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			166			5			19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		608			1839			695			734	
Travel Time (s)		13.8			41.8			15.8			16.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	123	55	10	108	267	20	295	16	272	358	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	201	0	0	385	0	0	331	0	0	708	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			8			2			1	1 6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	1 6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		20.0	20.0			6.0	
Minimum Split (s)	16.0	16.0		16.0	16.0		26.0	26.0			12.0	
Total Split (s)	17.0	17.0		17.0	17.0		26.0	26.0			17.0	
Total Split (%)	28.3%	28.3%		28.3%	28.3%		43.3%	43.3%			28.3%	
Maximum Green (s)	11.0	11.0		11.0	11.0		20.0	20.0			11.0	
Yellow Time (s)	3.2	3.2		3.2	3.2		3.2	3.2			3.2	
All-Red Time (s)	2.8	2.8		2.8	2.8		2.8	2.8			2.8	
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		6.0			6.0			6.0				
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		
Recall Mode	None	None		None	None		Max	Max		None		
Act Effct Green (s)		10.8			10.8			20.0			37.0	
Actuated g/C Ratio		0.18			0.18			0.33			0.62	
v/c Ratio		0.77			0.88			0.57			0.89	
Control Delay		42.8			38.3			20.8			24.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		42.8			38.3			20.8			24.3	
LOS		D			D			C			C	
Approach Delay		42.8			38.3			20.8			24.3	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		60			76			95			133	
Queue Length 95th (ft)		#158			#221			167			#354	
Internal Link Dist (ft)		528			1759			615			654	

Lane Group	Ø6
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
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	6
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	20.0
Minimum Split (s)	26.0
Total Split (s)	43.0
Total Split (%)	72%
Maximum Green (s)	37.0
Yellow Time (s)	3.2
All-Red Time (s)	2.8
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	

Lanes, Volumes, Timings
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 Saturday Build Condition



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)	265			442			582			800		
Starvation Cap Reductn	0			0			0			0		
Spillback Cap Reductn	0			0			0			0		
Storage Cap Reductn	0			0			0			0		
Reduced v/c Ratio	0.76			0.87			0.57			0.89		

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 59.8

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 29.2

Intersection LOS: C

Intersection Capacity Utilization 89.4%

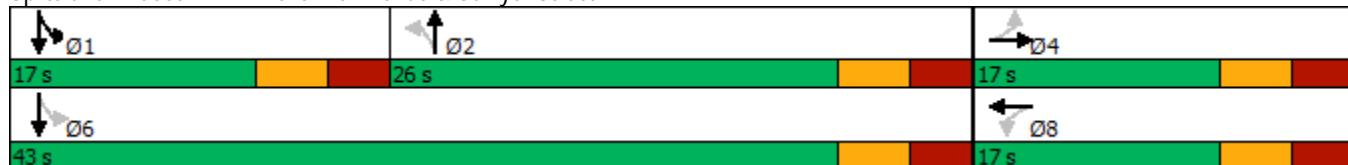
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: Belleville Avenue & Sawyer Street



Lane Group	Ø6
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
17: Belleville Avenue & Sawyer Street

Coggeshall Street
2027 Saturday Build Condition

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	113	51	9	99	246	18	271	15	250	329	72
Future Volume (vph)	21	113	51	9	99	246	18	271	15	250	329	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0				6.0			6.0
Lane Util. Factor		1.00				1.00			1.00			1.00
Frt		0.96				0.91			0.99			0.99
Flt Protected		0.99				1.00			1.00			0.98
Satd. Flow (prot)		1784				1686			1845			1800
Flt Permitted		0.73				0.99			0.94			0.58
Satd. Flow (perm)		1316				1670			1732			1061
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	123	55	10	108	267	20	295	16	272	358	78
RTOR Reduction (vph)	0	23	0	0	136	0	0	3	0	0	7	0
Lane Group Flow (vph)	0	178	0	0	249	0	0	328	0	0	701	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4				8			2		1	1 6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.8			10.8			20.0			37.0	
Effective Green, g (s)		10.8			10.8			20.0			37.0	
Actuated g/C Ratio		0.18			0.18			0.33			0.62	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		237			301			579			792	
v/s Ratio Prot											c0.16	
v/s Ratio Perm		0.14			c0.15			0.19			c0.38	
v/c Ratio		0.75			0.83			0.57			0.88	
Uniform Delay, d1		23.2			23.6			16.3			9.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		12.6			16.8			4.0			11.5	
Delay (s)		35.8			40.4			20.3			21.1	
Level of Service		D			D			C			C	
Approach Delay (s)		35.8			40.4			20.3			21.1	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		27.3			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.97										
Actuated Cycle Length (s)		59.8			Sum of lost time (s)			18.0				
Intersection Capacity Utilization		89.4%			ICU Level of Service			E				
Analysis Period (min)		15										

c Critical Lane Group