

Traffic Signal Timing & Optimization Study

BEDFORD ROAD, VILLAGE OF PLEASANTVILLE

Study Area/ Locations

BEDFORD ROAD CORRIDOR

INTERSECTIONS

- Bedford Road & Pleasantville Road
- Bedford Road & Marble Avenue/Memorial Plaza
- Bedford Road & Wheeler Avenue



Bedford Road & Pleasantville Road

- 3-Phase Traffic Signal
 - Bedford Rd. WB Left-Turn
 - Bedford Rd./Pleasantville Rd. ROW
 - Bedford Rd. NB ROW
- Pedestrian Crossings with Corresponding Vehicle Phase
- Lower Pedestrian Activity
- Best Overall Operating Intersection



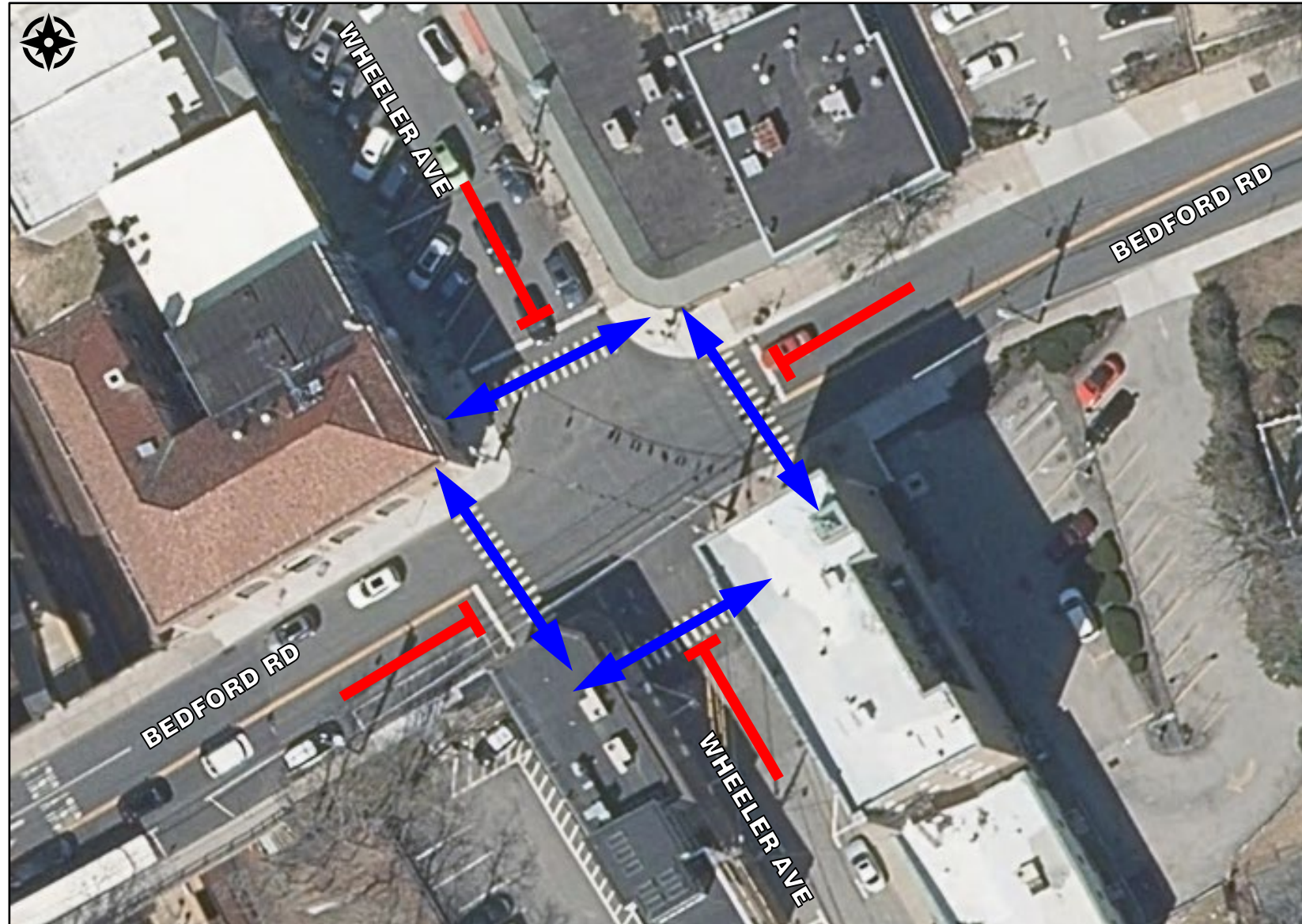
Bedford Road & Marble Avenue/Memorial Plaza

- 2-Phase Traffic Signal
 - Bedford Rd. ROW
 - Marble Ave./Memorial Plz. ROW
- Pedestrian Crossings with Corresponding Vehicle Phase
- Higher Pedestrian Activity
- Worst Overall Operating Intersection
- Marble Avenue Left-Turn Lane Near Capacity



Bedford Road & Wheeler Avenue

- 3-Phase Traffic Signal
 - Bedford Rd. ROW
 - Wheeler Ave. ROW
 - Exclusive Pedestrian Phase
- Pedestrian Crossings with Exclusive Pedestrian Phase (All Vehicle Phases Stopped)
- Exclusive Pedestrian Phase Utilization = 23% (Average)
- Higher Pedestrian Activity



Traffic Counts

MANUAL TURNING MOVEMENT (MTM)

LOCATIONS

- Bedford Road & Pleasantville Road
- Bedford Road & Marble Avenue/Memorial Plaza
- Bedford Road & Wheeler Avenue

TIME PERIODS

- Peak Weekday AM
 - Count Period: 6:30 AM – 9:30 AM
 - Peak Hour: 7:45 AM – 8:45 AM
- Peak Weekday Midday
 - Count Period: 11:00 AM – 2:00 PM
 - Peak Hour: 11:45 AM – 12:45 PM
- Peak Weekday PM
 - Count Period: 4:00 PM – 7:00 PM
 - Peak Hour: 4:45 PM – 5:45 PM
- Peak Saturday Midday
 - Count Period: 11:00 AM – 2:00 PM
 - Peak Hour: 11:00 AM – 12:00 PM

SUMMARY

- TOTAL HOURS COUNTED = 12 HOURS
- TOTAL VEHICLES COUNTED = ~40,000 VEHICLES
- TOTAL PEDESTRIANS COUNTED = ~3,000 PEDS



Traffic Counts

AUTOMATIC TRAFFIC RECORDER (ATR)

LOCATIONS

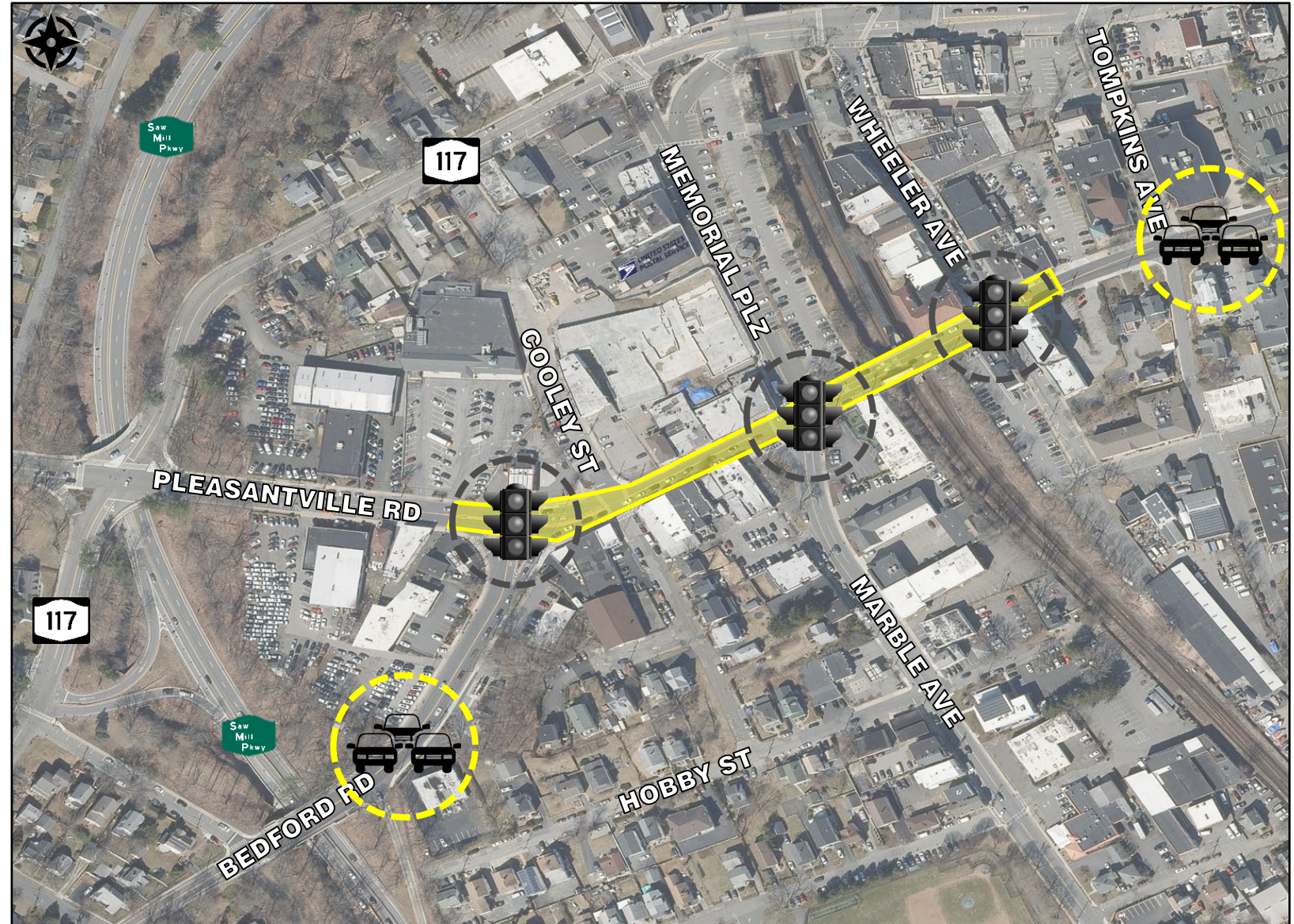
- Bedford Road s/o Pleasantville Road
- Bedford Road e/o Wheeler Avenue

TIME PERIODS

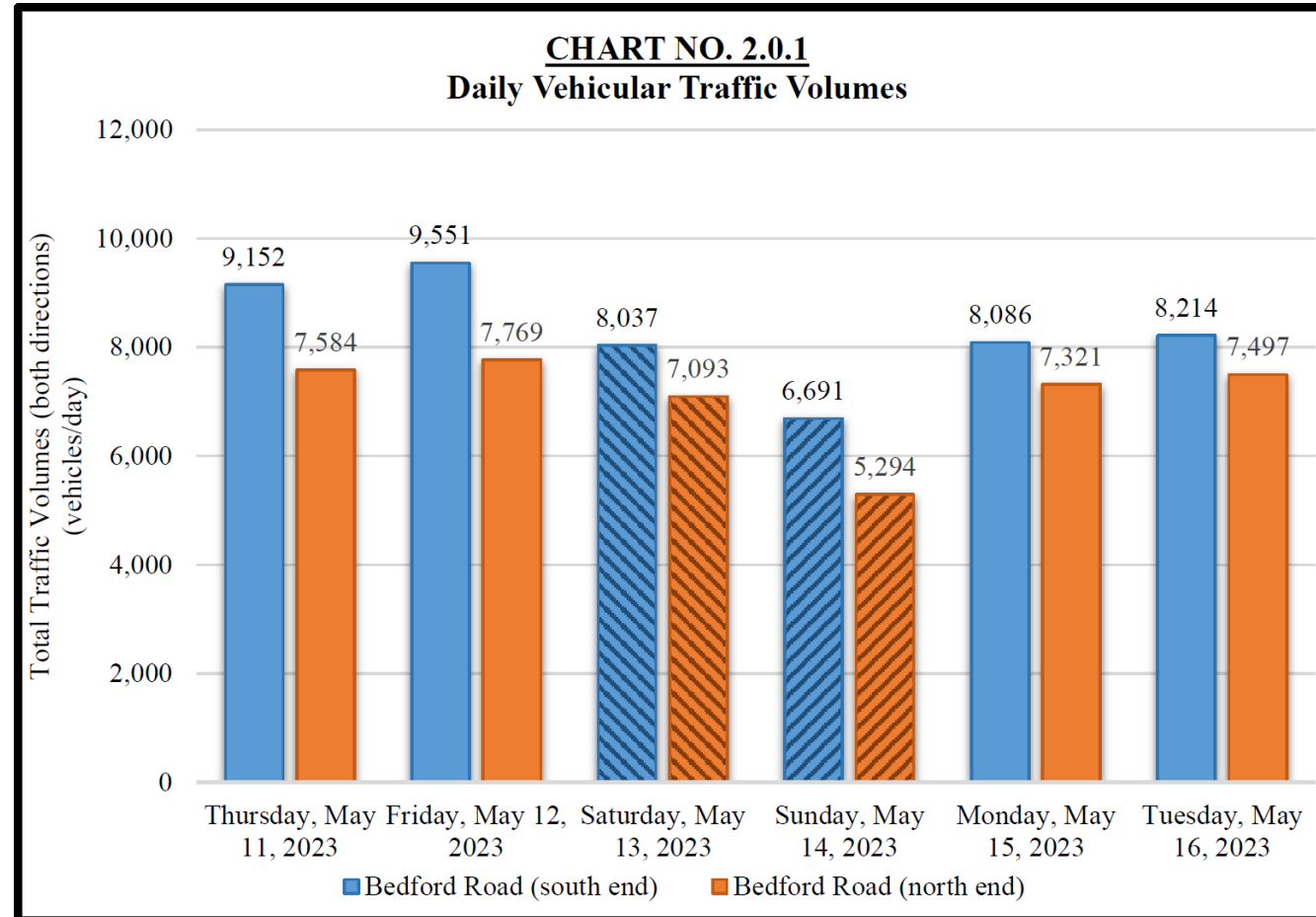
- 24/7 for One Week

SUMMARY

- TOTAL HOURS COUNTED = 168 HOURS
- TOTAL VEHICLES COUNTED = ~118,000 VEHICLES



Existing Daily Traffic Volume Variation



Existing Weekday Hourly Traffic Volume Variation

CHART NO. 2.0.2
Hourly Vehicular Traffic Volumes - Weekday
Bedford Road (south of Pleasantville Road)

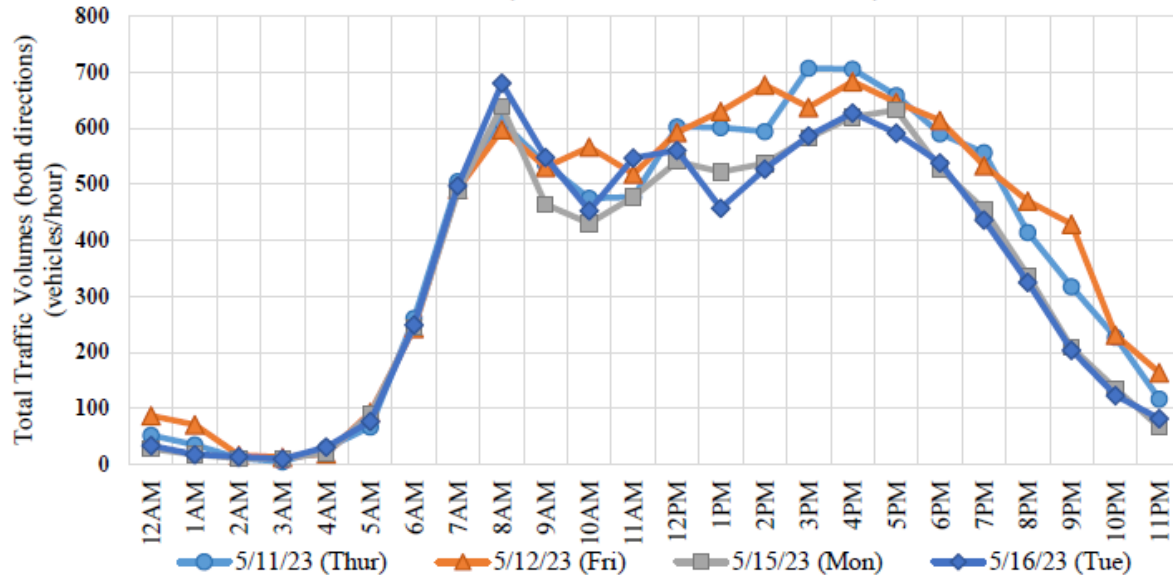
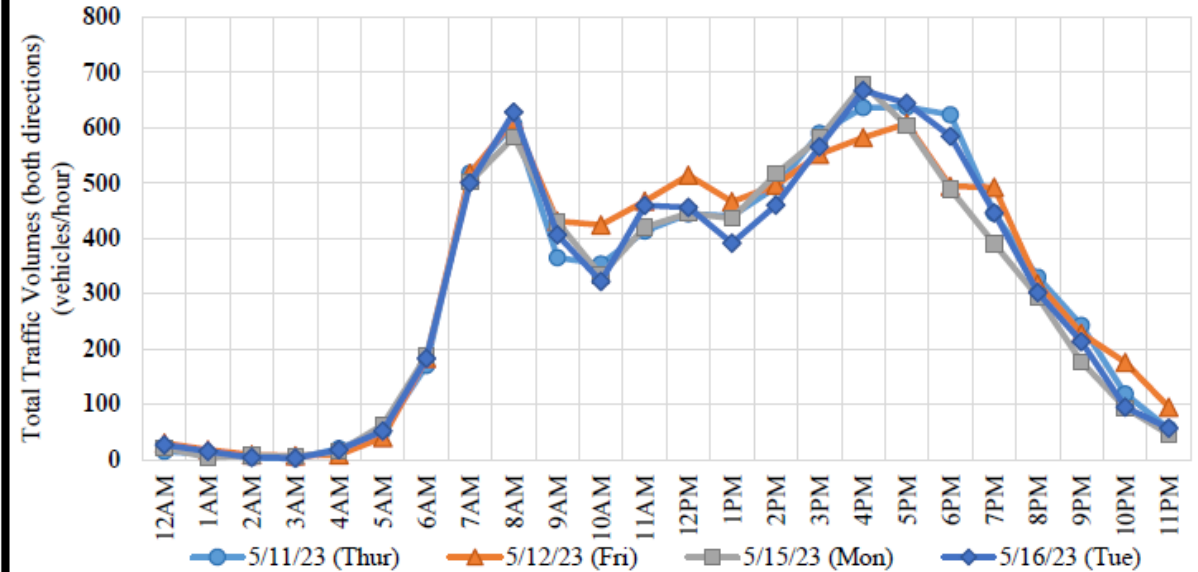


CHART NO. 2.0.3
Hourly Vehicular Traffic Volumes - Weekday
Bedford Road (east of Thompkins Avenue)



Existing Weekend Hourly Traffic Volume Variation

CHART NO. 2.0.4
Hourly Vehicular Traffic Volumes - Weekend
Bedford Road (south of Pleasantville Road)

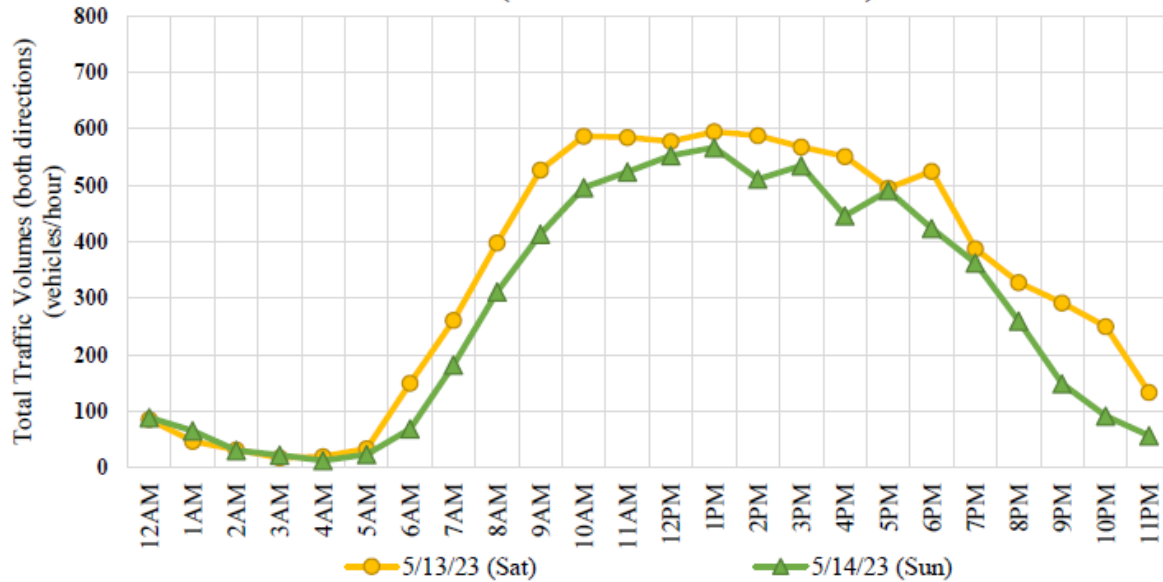
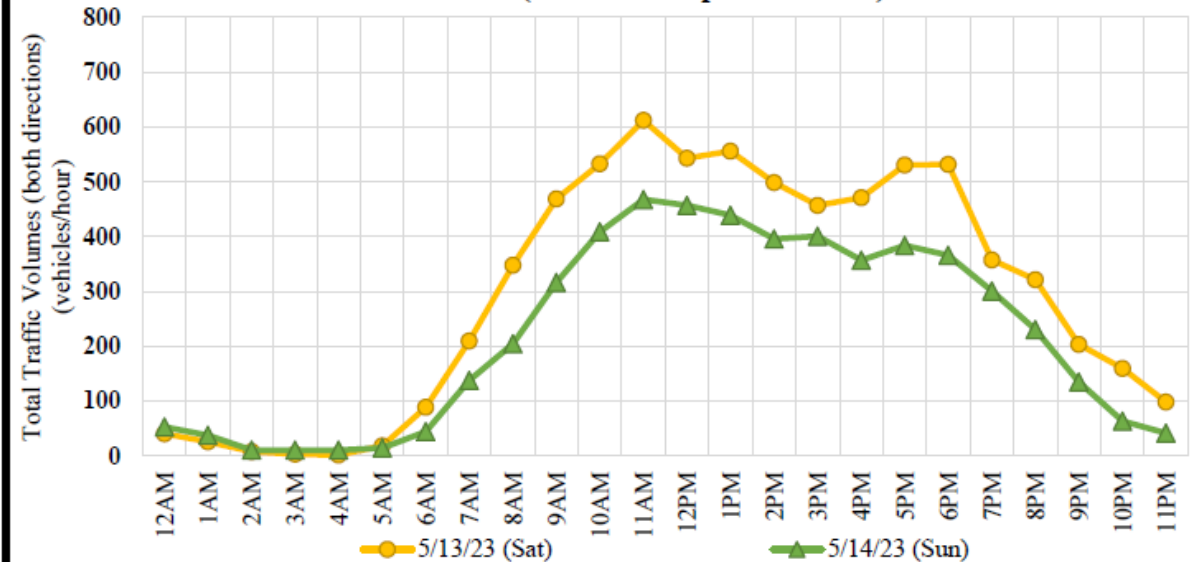


CHART NO. 2.0.5
Hourly Vehicular Traffic Volumes - Weekend
Bedford Road (east of Thompkins Avenue)



FUTURE TRAFFIC VOLUME PROJECTIONS

- Reviewed “Zoning Impact Analyses” Prepared by BFJ Planning for the Village
- Reviewed Historical Traffic Count Information at Five New York State Department of Transportation (NYSDOT) Count Stations
 - Historical Data Generally Indicates Downward Trend in Growth
- **Projected Future Traffic Volumes by Utilizing an Annually Compounded Growth Rate of 1.0% Per Year for 10 Years**
 - Results in a Conservative 10.5% Overall Growth to Existing Volumes (Vehicle & Pedestrian)

TRAFFIC ANALYSIS

- Performed Intersection Highway Capacity Analysis Utilizing Synchro Software
- Performed Microscopic Simulation Analysis Utilizing SimTraffic Software
- Intersection Analysis Performed at All Three Study Locations
- Corridor Analysis Performed for Entire Length of Corridor within Study Area
- Analysis Performed for Both Existing and Future Traffic Volume Conditions
 - 2023 Existing
 - 2033 Future
- Analysis Performed for All Peak Hours
 - Peak Weekday AM Hour: 7:45 AM – 8:45 AM
 - Peak Weekday Midday Hour: 11:45 AM – 12:45 PM
 - Peak Weekday PM Hour: 4:45 PM – 5:45 PM
 - Peak Saturday Midday Hour: 11:00 AM – 12:00 PM

IMPROVEMENT ALTERNATIVES

- Four Alternatives Studied for Existing and Future Traffic Volume Conditions
 1. No Action
 2. Revised Traffic Signal Timings with Coordination (Maintain Exclusive Pedestrian Phase)
 3. Revised Traffic Signal Timings with Coordination (Remove Exclusive Pedestrian Phase)
 4. Revised Traffic Signal Timings with Coordination (Implement Leading Pedestrian Interval)

- **2 Traffic Volume Conditions + 4 Peak Hours + 4 Alternatives = Total of 32 Different Traffic Scenarios Analyzed**

Intersection Level of Service Results

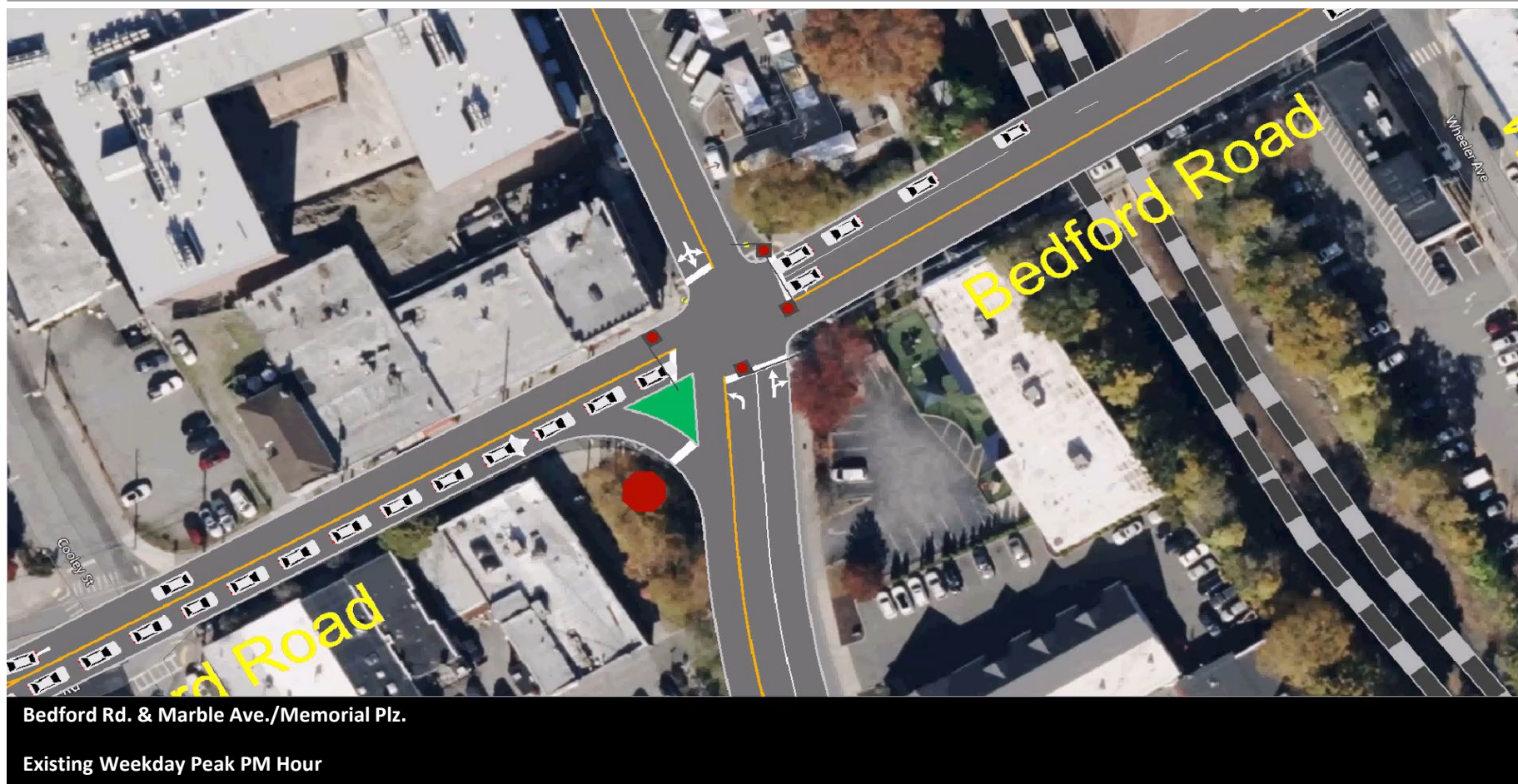
TABLE NO. D-3.2
INTERSECTION CAPACITY ANALYSIS RESULTS SUMMARY TABLE
2033 FUTURE (10-YEAR) TRAFFIC VOLUMES
BEDFORD ROAD & WHEELER AVENUE

	SCENARIO E						SCENARIO F						SCENARIO G						SCENARIO H					
	V/C	Delay (sec/veh)	LOS	Queues			V/C	Delay (sec/veh)	LOS	Queues			V/C	Delay (sec/veh)	LOS	Queues			V/C	Delay (sec/veh)	LOS	Queues		
				50th (feet)	/	90th (feet)				50th (feet)	/	90th (feet)				50th (feet)	/	90th (feet)				50th (feet)	/	90th (feet)
Weekday Peak AM Hour (7:45 AM - 8:45 AM)																								
Bedford Road EB Thru/Right	0.45	15.8	B	103	/	403	0.49	13.1	B	33	/	355	0.47	8.0	A	57	/	175	0.53	10.6	B	77	/	126
Bedford Road WB Left/Thru	0.25	10.6	B	60	/	217	0.26	9.4	A	41	/	176	0.25	6.7	A	48	/	108	0.29	9.6	A	66	/	132
Wheeler Avenue NB Left/Right	0.09	31.2	C	9	/	25	0.11	26.2	C	6	/	22	0.08	19.9	B	6	/	18	0.09	22.0	C	6	/	20
Wheeler Avenue SB Left/Thru/Right	0.67	48.7	D	97	/	153	0.76	51.5	D	67	/	159	0.56	30.4	C	63	/	106	0.59	33.5	C	68	/	115
OVERALL	-	20.0	C	-	-	-	-	18.7	B	-	-	-	-	11.6	B	-	-	-	-	14.4	B	-	-	-
Weekday Peak Midday Hour (11:45 AM - 12:45 PM)																								
Bedford Road EB Thru/Right	0.41	24.1	C	91	/	288	0.38	14.5	B	86	/	229	0.32	6.6	A	22	/	88	0.38	9.3	A	42	/	76
Bedford Road WB Left/Thru	0.26	19.0	B	67	/	201	0.24	12.4	B	53	/	162	0.20	8.3	A	42	/	93	0.24	11.9	B	53	/	113
Wheeler Avenue NB Left/Right	0.14	25.6	C	15	/	33	0.16	24.7	C	12	/	32	0.11	17.5	B	9	/	23	0.12	17.8	B	9	/	23
Wheeler Avenue SB Left/Thru/Right	0.78	46.1	D	161	/	209	0.86	52.4	D	129	/	229	0.69	31.5	C	94	/	146	0.69	31.7	C	94	/	146
OVERALL	-	29.5	C	-	-	-	-	26.0	C	-	-	-	-	15.2	B	-	-	-	-	17.3	B	-	-	-
Weekday Peak PM Hour (4:45 PM - 5:45 PM)																								
Bedford Road EB Thru/Right	0.46	20.0	B	171	/	300	0.48	21.2	C	94	/	216	0.38	6.4	A	40	/	83	0.42	8.5	A	73	/	86
Bedford Road WB Left/Thru	0.40	17.5	B	183	/	306	0.43	15.8	B	64	/	285	0.33	6.9	A	69	/	149	0.36	9.7	A	96	/	181
Wheeler Avenue NB Left/Right	0.23	36.1	D	17	/	42	0.26	30.4	C	12	/	36	0.16	23.8	C	12	/	30	0.17	26.9	C	13	/	33
Wheeler Avenue SB Left/Thru/Right	0.66	48.6	D	95	/	150	0.73	47.5	D	65	/	153	0.56	32.6	C	66	/	109	0.59	36.9	D	72	/	121
OVERALL	-	24.0	C	-	-	-	-	23.3	C	-	-	-	-	11.3	B	-	-	-	-	14.1	B	-	-	-
Saturday Peak Midday Hour (11:00 AM - 12:00 PM)																								
Bedford Road EB Thru/Right	0.44	22.8	C	163	/	289	0.51	25.3	C	155	/	247	0.37	8.2	A	45	/	133	0.43	11.4	B	71	/	108
Bedford Road WB Left/Thru	0.33	19.8	B	145	/	252	0.38	19.2	B	127	/	205	0.27	8.1	A	61	/	128	0.32	11.4	B	78	/	149
Wheeler Avenue NB Left/Right	0.13	28.2	C	14	/	33	0.16	25.7	C	10	/	31	0.11	19.7	B	10	/	25	0.12	20.6	C	10	/	26
Wheeler Avenue SB Left/Thru/Right	0.74	47.0	D	140	/	202	0.85	54.5	D	104	/	220	0.69	33.9	C	97	/	149	0.70	35.3	D	97	/	155
OVERALL	-	28.0	C	-	-	-	-	30.6	C	-	-	-	-	15.0	B	-	-	-	-	17.7	B	-	-	-

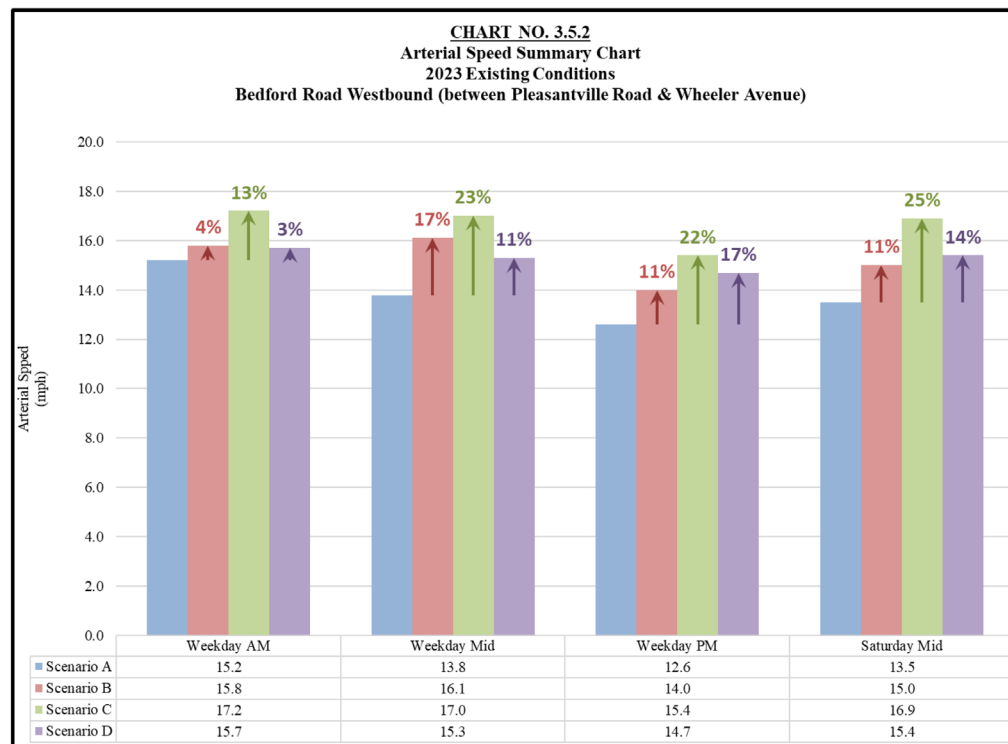
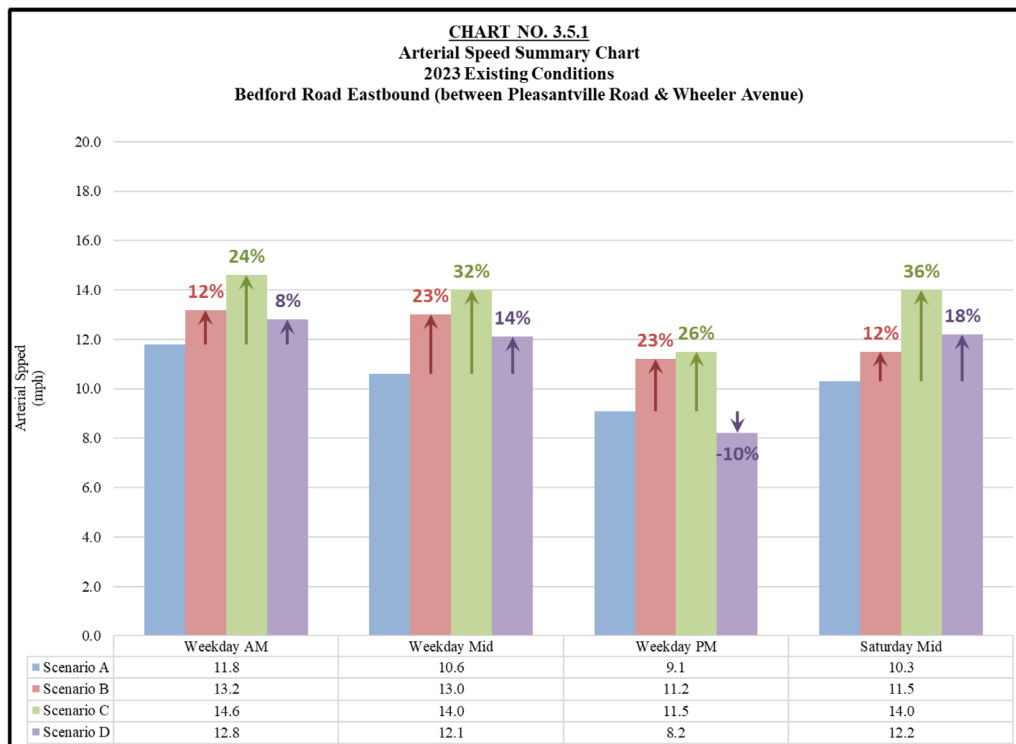
Arterial Level of Service Results

TABLE NO. D-4.1 ARTERIAL ANALYSIS RESULTS SUMMARY TABLE 2023 EXISTING TRAFFIC VOLUMES BEDFORD ROAD (FROM PLEASANTVILLE ROAD TO WHEELER AVENUE)																
	SCENARIO A				SCENARIO B				SCENARIO C				SCENARIO D			
	Signal Delay (seconds)	Travel Time (seconds)	Arterial Speed (mph)	LOS	Signal Delay (seconds)	Travel Time (seconds)	Arterial Speed (mph)	LOS	Signal Delay (seconds)	Travel Time (seconds)	Arterial Speed (mph)	LOS	Signal Delay (seconds)	Travel Time (seconds)	Arterial Speed (mph)	LOS
<i>Weekday Peak AM Hour (7:45 AM - 8:45 AM)</i>																
Bedford Road EB Total	28.7	77.0	11.8	D	20.3	68.6	13.2	C	13.7	62.0	14.6	C	22.7	71.0	12.8	D
Bedford Road WB Total	23.4	79.8	15.2	C	20.6	77.0	15.8	C	14.2	70.6	17.2	C	20.8	77.2	15.7	C
<i>Weekday Peak Midday Hour (11:45 AM - 12:45 PM)</i>																
Bedford Road EB Total	37.4	85.7	10.6	D	21.3	69.6	13.0	C	16.5	64.8	14.0	C	26.5	74.8	12.1	D
Bedford Road WB Total	31.6	88.0	13.8	C	18.9	75.3	16.1	C	15.1	71.5	17.0	C	23.1	79.5	15.3	C
<i>Weekday Peak PM Hour (4:45 PM - 5:45 PM)</i>																
Bedford Road EB Total	51.4	99.7	9.1	D	32.4	80.7	11.2	D	30.7	79.0	11.5	D	62.1	110.4	8.2	E
Bedford Road WB Total	39.8	96.2	12.6	D	30.3	86.7	14.0	C	22.4	78.8	15.4	C	26.1	82.5	14.7	C
<i>Saturday Peak Midday Hour (11:00 AM - 12:00 PM)</i>																
Bedford Road EB Total	39.8	88.1	10.3	D	30.1	78.4	11.5	D	16.2	64.5	14.0	C	25.9	74.2	12.2	D
Bedford Road WB Total	33.6	90.0	13.5	C	24.5	80.9	15.0	C	15.5	71.9	16.9	C	22.5	78.9	15.4	C

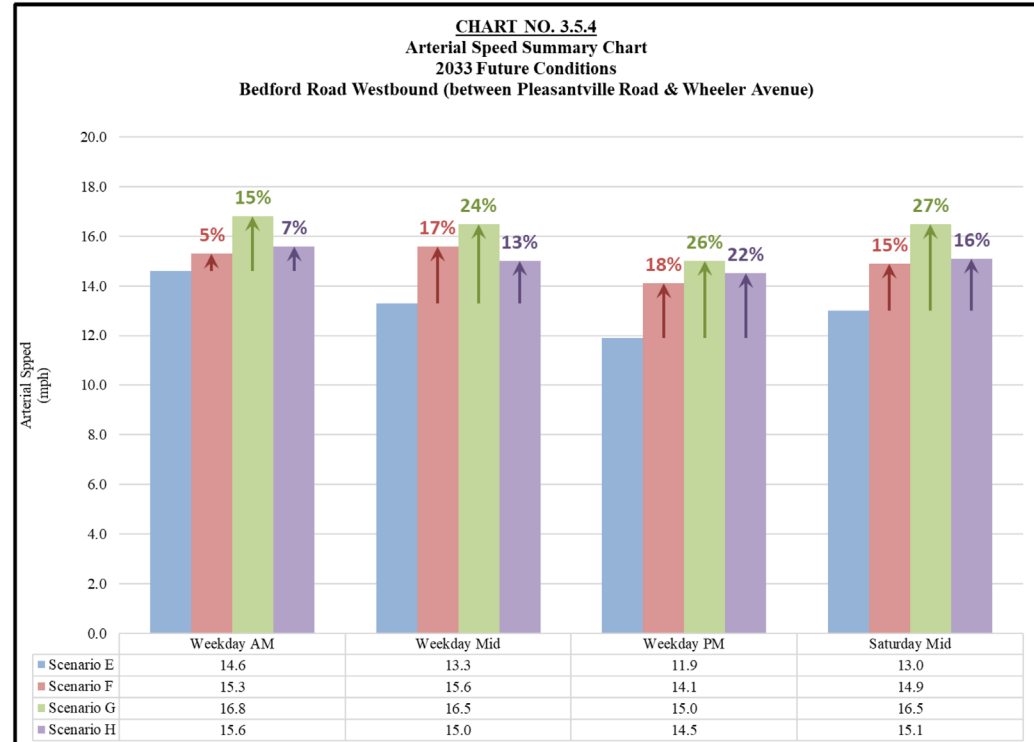
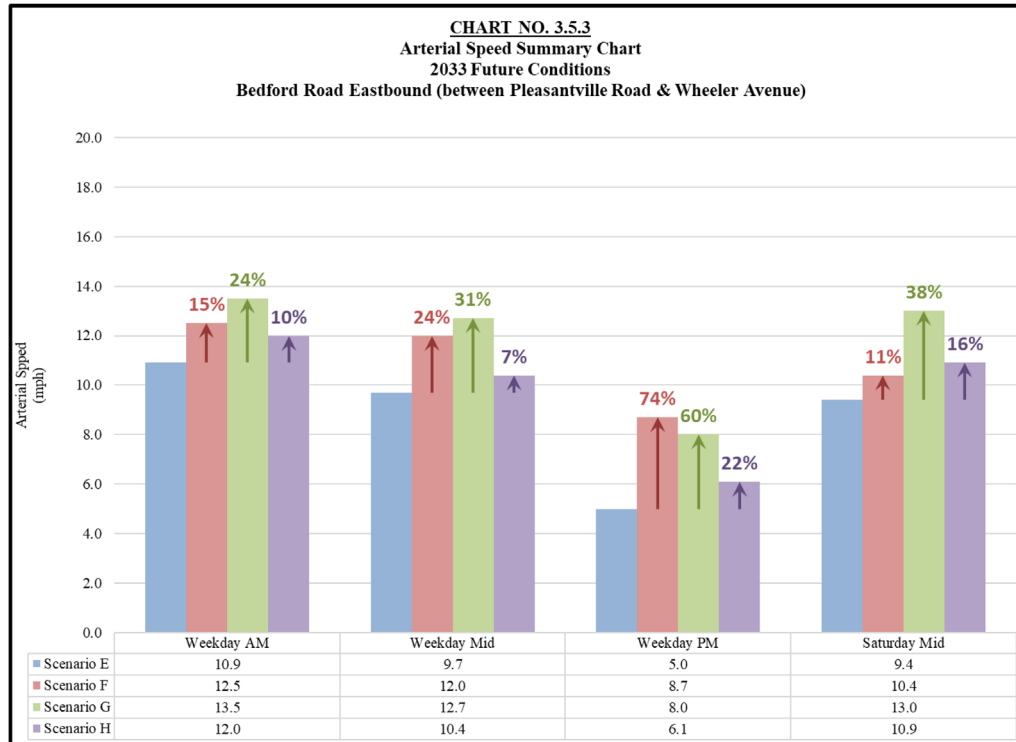
Microscopic Simulation Analysis



Arterial Speed – Existing Conditions



Arterial Speed – Future Conditions

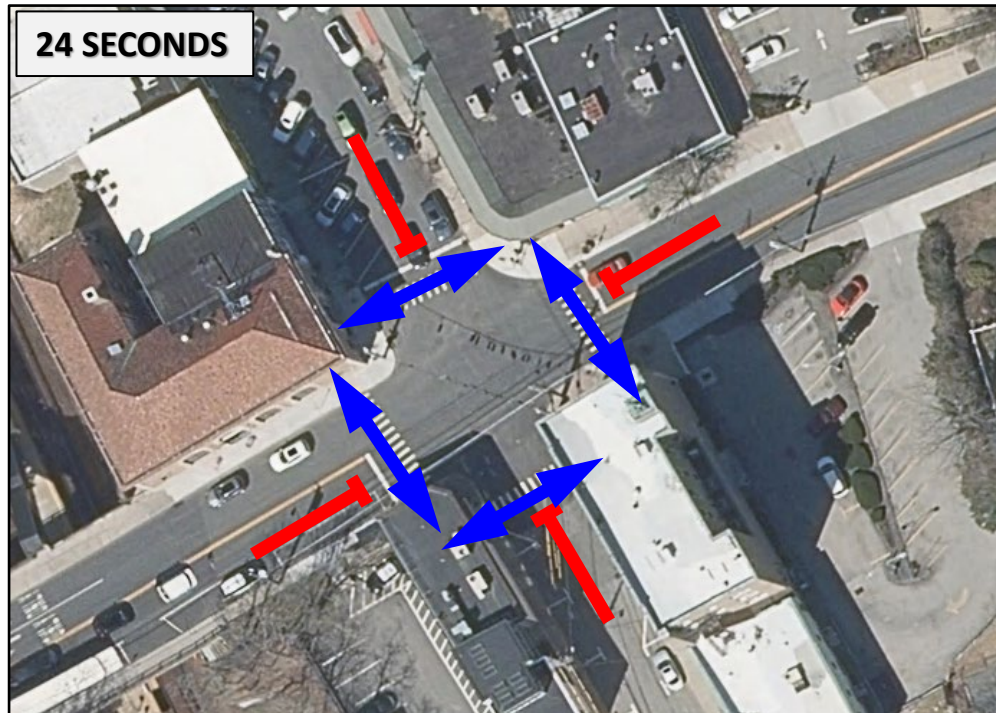


Benefits & Disadvantages

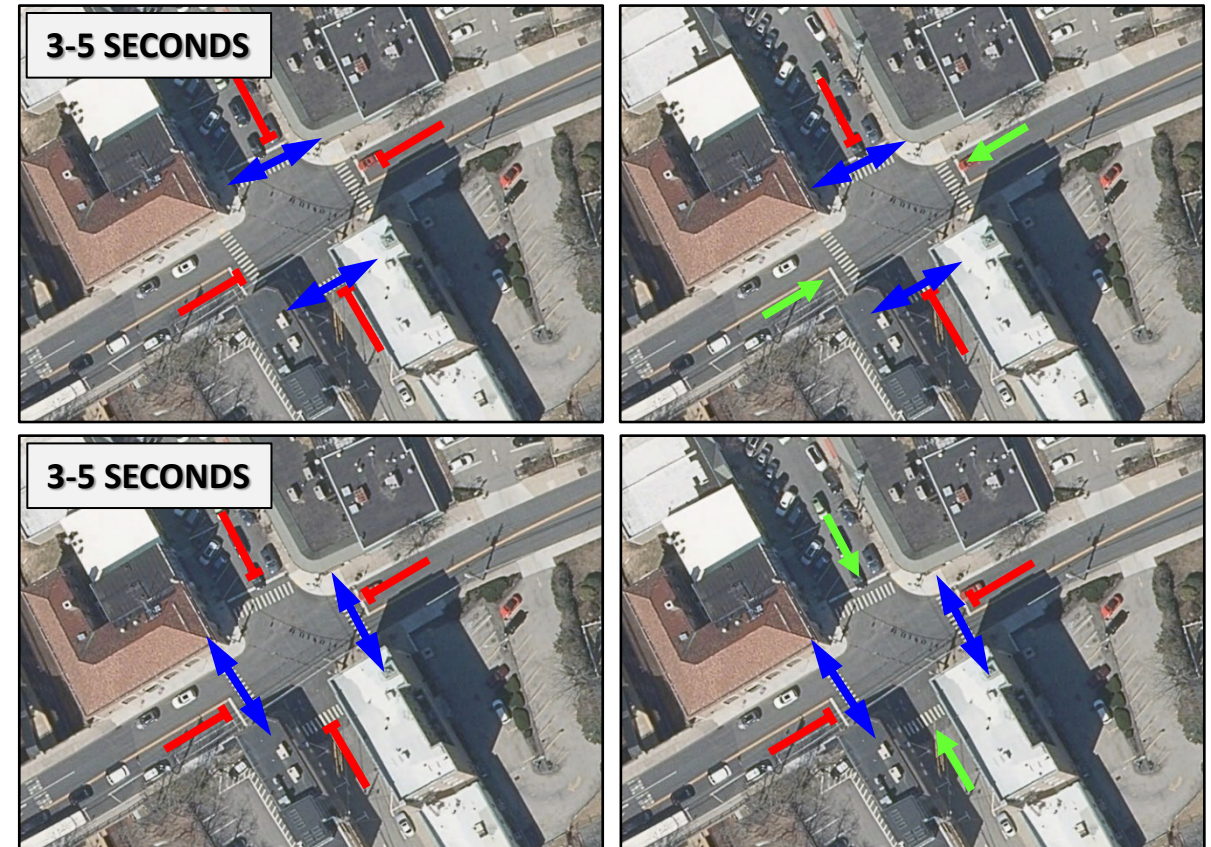
	ALTERNATIVE			
	No Action	Maintain Exclusive Pedestrian Phase (EPP)	Eliminate Exclusive Pedestrian Phase (EPP)	Implement Leading Pedestrian Interval (LPI)
Benefits	No costs	Improves operations along corridor	Provides best improved operations along corridor	Improves operations along corridor
		Maintains existing pedestrian safety	More time dedicated to vehicles	Maintains level of pedestrian safety
Disadvantages	No improvement to corridor	Improvements limited due to EPP	Decrease in pedestrian safety	Improvements limited due to LPI
	Issues will get worse in future	May require additional equipment/upgrades	May require additional equipment/upgrades	May require additional equipment/upgrades

Exclusive Pedestrian Phase vs. Leading Pedestrian Interval (LPI)

EXCLUSIVE PEDESTRIAN PHASE



LEADING PEDESTRIAN INTERVAL (LPI)



Next Steps

- Consult with Traffic Signal Maintenance Contractor
 - Test Functionality of Existing Traffic Signal Equipment
 - Determine if Additional Equipment is Required for Recommended Improvements
- Prepare Detailed Traffic Signal Plans & Timing Permits
- Prepare Construction Cost Estimates
- Construct Recommended Improvements

Questions



Thank you

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