
















TIP Before and After Evaluations - Quincy - Hancock Street AM
 2: RT 3A/Hancock St./Hancock SB & Hunt St.













12/20/2023

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Lane Configurations | |  | | |  | | |  | | | | |
| Traffic Volume (vph) | 28 | 385 | 22 | 1 | 625 | 182 | 17 | 0 | 20 | 0 | 0 | 0 |
| Future Volume (vph) | 28 | 385 | 22 | 1 | 625 | 182 | 17 | 0 | 20 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Fr _t | | 0.992 | | | 0.966 | | | 0.928 | | | | |
| Fl _t Protected | | 0.997 | | | | | | 0.977 | | | | |
| Satd. Flow (prot) | 0 | 3433 | 0 | 0 | 3353 | 0 | 0 | 1672 | 0 | 0 | 0 | 0 |
| Fl _t Permitted | | 0.843 | | | 0.955 | | | 0.977 | | | | |
| Satd. Flow (perm) | 0 | 2903 | 0 | 0 | 3202 | 0 | 0 | 1672 | 0 | 0 | 0 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 8 | | | 57 | | | 82 | | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | | 30 |
| Link Distance (ft) | | 351 | | | 554 | | | 161 | | | | 233 |
| Travel Time (s) | | 8.0 | | | 12.6 | | | 3.7 | | | | 5.3 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.66 | 0.66 | 0.66 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 2% | 2% | 2% |
| Adj. Flow (vph) | 36 | 494 | 28 | 1 | 679 | 198 | 26 | 0 | 30 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 558 | 0 | 0 | 878 | 0 | 0 | 56 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | | | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | | | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | | | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | | | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | | | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | | | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Detector Phase | 6 | 6 | | 2 | 2 | | 4 | 4 | | | | |
| Switch Phase | | | | | | | | | | | | |

| | |
|----------------------------|----|
| Lane Group | Ø9 |
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Lane Util. Factor | |
| Fr't | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Heavy Vehicles (%) | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 2: RT 3A/Hancock St./Hancock SB & Hunt St.

12/20/2023

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Minimum Initial (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 7.0 | 7.0 | | | | |
| Minimum Split (s) | 19.0 | 19.0 | | 19.0 | 19.0 | | 13.5 | 13.5 | | | | |
| Total Split (s) | 81.0 | 81.0 | | 81.0 | 81.0 | | 19.0 | 19.0 | | | | |
| Total Split (%) | 67.5% | 67.5% | | 67.5% | 67.5% | | 15.8% | 15.8% | | | | |
| Maximum Green (s) | 73.0 | 73.0 | | 73.0 | 73.0 | | 13.0 | 13.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.5 | 3.5 | | | | |
| All-Red Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 2.5 | 2.5 | | | | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Total Lost Time (s) | | 8.0 | | | 8.0 | | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | | | |
| Act Effct Green (s) | | 103.1 | | | 103.1 | | | 7.1 | | | | |
| Actuated g/C Ratio | | 0.86 | | | 0.86 | | | 0.06 | | | | |
| v/c Ratio | | 0.22 | | | 0.32 | | | 0.32 | | | | |
| Control Delay (s/veh) | | 2.2 | | | 1.5 | | | 9.9 | | | | |
| Queue Delay | | 0.0 | | | 0.1 | | | 0.0 | | | | |
| Total Delay (s/veh) | | 2.2 | | | 1.6 | | | 9.9 | | | | |
| LOS | | A | | | A | | | A | | | | |
| Approach Delay (s/veh) | | 2.2 | | | 1.6 | | | 9.9 | | | | |
| Approach LOS | | A | | | A | | | A | | | | |
| 90th %ile Green (s) | 98.6 | 98.6 | | 98.6 | 98.6 | | 7.4 | 7.4 | | | | |
| 90th %ile Term Code | Coord | Coord | | Coord | Coord | | Gap | Gap | | | | |
| 70th %ile Green (s) | 99.0 | 99.0 | | 99.0 | 99.0 | | 7.0 | 7.0 | | | | |
| 70th %ile Term Code | Coord | Coord | | Coord | Coord | | Min | Min | | | | |
| 50th %ile Green (s) | 99.0 | 99.0 | | 99.0 | 99.0 | | 7.0 | 7.0 | | | | |
| 50th %ile Term Code | Coord | Coord | | Coord | Coord | | Min | Min | | | | |
| 30th %ile Green (s) | 99.0 | 99.0 | | 99.0 | 99.0 | | 7.0 | 7.0 | | | | |
| 30th %ile Term Code | Coord | Coord | | Coord | Coord | | Min | Min | | | | |
| 10th %ile Green (s) | 112.0 | 112.0 | | 112.0 | 112.0 | | 0.0 | 0.0 | | | | |
| 10th %ile Term Code | Coord | Coord | | Coord | Coord | | Skip | Skip | | | | |
| Stops (vph) | | 71 | | | 73 | | | 3 | | | | |
| Fuel Used(gal) | | 2 | | | 4 | | | 0 | | | | |
| CO Emissions (g/hr) | | 124 | | | 289 | | | 10 | | | | |
| NOx Emissions (g/hr) | | 24 | | | 56 | | | 2 | | | | |
| VOC Emissions (g/hr) | | 29 | | | 67 | | | 2 | | | | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | | |
| Queue Length 50th (ft) | | 37 | | | 40 | | | 0 | | | | |
| Queue Length 95th (ft) | | 42 | | | 41 | | | 0 | | | | |
| Internal Link Dist (ft) | | 271 | | | 474 | | | 81 | | | 153 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 2495 | | | 2759 | | | 254 | | | | |
| Starvation Cap Reductn | | 0 | | | 597 | | | 0 | | | | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | | |
| Reduced v/c Ratio | | 0.22 | | | 0.41 | | | 0.22 | | | | |
| Intersection Summary | | | | | | | | | | | | |

| | |
|-----------------------------|------|
| Lane Group | Ø9 |
| Minimum Initial (s) | 16.0 |
| Minimum Split (s) | 20.0 |
| Total Split (s) | 20.0 |
| Total Split (%) | 17% |
| Maximum Green (s) | 16.0 |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 2.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay (s/veh) | |
| Queue Delay | |
| Total Delay (s/veh) | |
| LOS | |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 0.0 |
| 90th %ile Term Code | Skip |
| 70th %ile Green (s) | 0.0 |
| 70th %ile Term Code | Skip |
| 50th %ile Green (s) | 0.0 |
| 50th %ile Term Code | Skip |
| 30th %ile Green (s) | 0.0 |
| 30th %ile Term Code | Skip |
| 10th %ile Green (s) | 0.0 |
| 10th %ile Term Code | Skip |
| Stops (vph) | |
| Fuel Used(gal) | |
| CO Emissions (g/hr) | |
| NOx Emissions (g/hr) | |
| VOC Emissions (g/hr) | |
| Dilemma Vehicles (#) | |
| Queue Length 50th (ft) | |
| Queue Length 95th (ft) | |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |
| Intersection Summary | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 2: RT 3A/Hancock St./Hancock SB & Hunt St.

12/20/2023






















| | | |
|------------------------------------|---|------------------------|
| Area Type: | Other | |
| Cycle Length: | 120 | |
| Actuated Cycle Length: | 120 | |
| Offset: | 0 (0%), Referenced to phase 2:NWTL and 6:SETL, Start of Green | |
| Natural Cycle: | 60 | |
| Control Type: | Actuated-Coordinated | |
| Maximum v/c Ratio: | 0.32 | |
| Intersection Signal Delay (s/veh): | 2.1 | Intersection LOS: A |
| Intersection Capacity Utilization | 50.2% | ICU Level of Service A |
| Analysis Period (min) | 15 | |

Splits and Phases: 2: RT 3A/Hancock St./Hancock SB & Hunt St.



TIP Before and After Evaluations - Quincy - Hancock Street AM
 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.

12/20/2023

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Lane Configurations | |  |  |  |  | |  |  | |  |  |  |
| Traffic Volume (vph) | 22 | 180 | 261 | 194 | 445 | 64 | 251 | 259 | 63 | 59 | 360 | 87 |
| Future Volume (vph) | 22 | 180 | 261 | 194 | 445 | 64 | 251 | 259 | 63 | 59 | 360 | 87 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 175 | 145 | | 245 | 0 | | 0 | 300 | | 200 |
| Storage Lanes | 0 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.981 | | | 0.970 | | | | 0.850 |
| Flt Protected | | 0.995 | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 3454 | 1553 | 1736 | 3405 | 0 | 1752 | 1789 | 0 | 1752 | 3505 | 1568 |
| Flt Permitted | | 0.854 | | 0.565 | | | 0.197 | | | 0.543 | | |
| Satd. Flow (perm) | 0 | 2964 | 1553 | 1032 | 3405 | 0 | 363 | 1789 | 0 | 1002 | 3505 | 1568 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 284 | | 12 | | | 10 | | | | 142 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | | 30 |
| Link Distance (ft) | | 320 | | | 429 | | | 622 | | | | 589 |
| Travel Time (s) | | 7.3 | | | 9.8 | | | 14.1 | | | | 13.4 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.91 | 0.91 | 0.91 | 0.88 | 0.88 | 0.88 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 3% | 3% | 3% |
| Adj. Flow (vph) | 24 | 196 | 284 | 213 | 489 | 70 | 285 | 294 | 72 | 71 | 434 | 105 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 220 | 284 | 213 | 559 | 0 | 285 | 366 | 0 | 71 | 434 | 105 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | | 12 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | Perm | NA | Prot | pm+pt | NA | | pm+pt | NA | | Perm | NA | Prot |
| Protected Phases | | 6 | 6 | 5 | 2 | | 7 | 4 | | 8 | | 8 |

| | |
|----------------------------|----|
| Lane Group | Ø9 |
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (ft) | |
| Storage Lanes | |
| Taper Length (ft) | |
| Lane Util. Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Heavy Vehicles (%) | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 9 |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.

12/20/2023

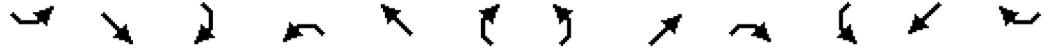


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|-----|-------|-------|
| Permitted Phases | 6 | | | 2 | | 4 | | | 8 | | | |
| Detector Phase | 6 | 6 | 6 | 5 | 2 | 7 | | 4 | 8 | | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 9.0 | 9.0 | 9.0 | 6.0 | 11.0 | 7.0 | | 10.0 | 10.0 | | 10.0 | 10.0 |
| Minimum Split (s) | 15.5 | 15.5 | 15.5 | 11.5 | 16.5 | 11.5 | | 15.5 | 15.5 | | 15.5 | 15.5 |
| Total Split (s) | 37.8 | 37.8 | 37.8 | 21.2 | 59.0 | 34.0 | | 67.0 | 33.0 | | 33.0 | 33.0 |
| Total Split (%) | 25.2% | 25.2% | 25.2% | 14.1% | 39.3% | 22.7% | | 44.7% | 22.0% | | 22.0% | 22.0% |
| Maximum Green (s) | 31.3 | 31.3 | 31.3 | 15.7 | 53.5 | 29.5 | | 61.5 | 27.5 | | 27.5 | 27.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 3.5 | 4.5 | 3.5 | | 4.5 | 4.5 | | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 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) | 6.5 | | 6.5 | 5.5 | 5.5 | 4.5 | | 5.5 | 5.5 | | 5.5 | 5.5 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | | | Lag | | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | Yes | | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | C-Max | C-Max | C-Max | None | C-Max | None | | None | None | | None | None |
| Act Effct Green (s) | 62.4 | | 62.4 | 84.0 | 84.0 | 56.0 | | 55.0 | 24.0 | | 24.0 | 24.0 |
| Actuated g/C Ratio | 0.42 | | 0.42 | 0.56 | 0.56 | 0.37 | | 0.37 | 0.16 | | 0.16 | 0.16 |
| v/c Ratio | 0.18 | | 0.35 | 0.33 | 0.29 | 0.75 | | 0.55 | 0.44 | | 0.77 | 0.28 |
| Control Delay (s/veh) | 30.6 | | 4.9 | 19.4 | 18.4 | 47.8 | | 39.2 | 65.2 | | 70.0 | 4.5 |
| Queue Delay | 0.0 | | 0.9 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.6 | | 5.8 | 19.4 | 18.4 | 47.8 | | 39.2 | 65.2 | | 70.0 | 4.5 |
| LOS | C | | A | B | B | D | | D | E | | E | A |
| Approach Delay (s/veh) | 16.6 | | 18.6 | | 43.0 | | 58.2 | | | | | |
| Approach LOS | B | | B | | D | | E | | | | | |
| 90th %ile Green (s) | 50.1 | 50.1 | 50.1 | 20.9 | 77.5 | 29.5 | | 61.5 | 27.5 | | 27.5 | 27.5 |
| 90th %ile Term Code | Coord | Coord | Coord | Gap | Coord | Max | | Hold | Max | | Max | Max |
| 70th %ile Green (s) | 53.3 | 53.3 | 53.3 | 17.7 | 77.5 | 29.5 | | 61.5 | 27.5 | | 27.5 | 27.5 |
| 70th %ile Term Code | Coord | Coord | Coord | Gap | Coord | Max | | Hold | Max | | Max | Max |
| 50th %ile Green (s) | 60.0 | 60.0 | 60.0 | 15.0 | 81.5 | 28.4 | | 57.5 | 24.6 | | 24.6 | 24.6 |
| 50th %ile Term Code | Coord | Coord | Coord | Gap | Coord | Gap | | Hold | Gap | | Gap | Gap |
| 30th %ile Green (s) | 68.2 | 68.2 | 68.2 | 12.5 | 87.2 | 24.9 | | 51.8 | 22.4 | | 22.4 | 22.4 |
| 30th %ile Term Code | Coord | Coord | Coord | Gap | Coord | Gap | | Hold | Gap | | Gap | Gap |
| 10th %ile Green (s) | 80.5 | 80.5 | 80.5 | 9.5 | 96.5 | 19.8 | | 42.5 | 18.2 | | 18.2 | 18.2 |
| 10th %ile Term Code | Coord | Coord | Coord | Gap | Coord | Gap | | Hold | Gap | | Gap | Gap |
| Stops (vph) | 129 | | 21 | 97 | 258 | 183 | | 240 | 52 | | 338 | 3 |
| Fuel Used(gal) | 2 | | 1 | 2 | 6 | 5 | | 5 | 1 | | 9 | 0 |
| CO Emissions (g/hr) | 173 | | 72 | 169 | 437 | 326 | | 382 | 94 | | 605 | 35 |
| NOx Emissions (g/hr) | 34 | | 14 | 33 | 85 | 64 | | 74 | 18 | | 118 | 7 |
| VOC Emissions (g/hr) | 40 | | 17 | 39 | 101 | 76 | | 88 | 22 | | 140 | 8 |
| Dilemma Vehicles (#) | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 |
| Queue Length 50th (ft) | 73 | | 0 | 105 | 148 | 202 | | 268 | 63 | | 216 | 0 |
| Queue Length 95th (ft) | 117 | | 65 | 166 | 200 | 267 | | 345 | 105 | | 248 | 11 |
| Internal Link Dist (ft) | 240 | | 349 | | 542 | | 509 | | | | | |
| Turn Bay Length (ft) | 175 | | 145 | | 300 | | 200 | | | | | |
| Base Capacity (vph) | 1233 | | 811 | 658 | 1913 | 408 | | 739 | 183 | | 642 | 403 |
| Starvation Cap Reductn | 0 | | 296 | 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 |

| | |
|-------------------------|------|
| Lane Group | Ø9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 16.5 |
| Minimum Split (s) | 24.0 |
| Total Split (s) | 24.0 |
| Total Split (%) | 16% |
| Maximum Green (s) | 18.0 |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 4.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay (s/veh) | |
| Queue Delay | |
| Total Delay (s/veh) | |
| LOS | |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 0.0 |
| 90th %ile Term Code | Skip |
| 70th %ile Green (s) | 0.0 |
| 70th %ile Term Code | Skip |
| 50th %ile Green (s) | 0.0 |
| 50th %ile Term Code | Skip |
| 30th %ile Green (s) | 0.0 |
| 30th %ile Term Code | Skip |
| 10th %ile Green (s) | 0.0 |
| 10th %ile Term Code | Skip |
| Stops (vph) | |
| Fuel Used(gal) | |
| CO Emissions (g/hr) | |
| NOx Emissions (g/hr) | |
| VOC Emissions (g/hr) | |
| Dilemma Vehicles (#) | |
| Queue Length 50th (ft) | |
| Queue Length 95th (ft) | |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.

12/20/2023

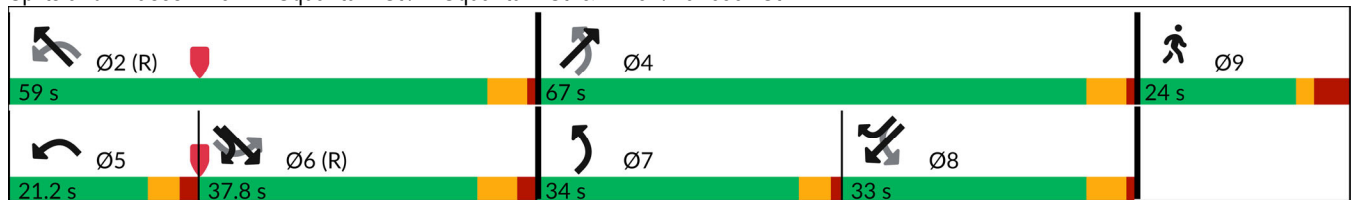


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------|-----|------|------|------|------|-----|------|------|-----|------|------|------|
| Reduced v/c Ratio | | 0.18 | 0.55 | 0.32 | 0.29 | | 0.70 | 0.50 | | 0.39 | 0.68 | 0.26 |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:NWTL and 6:SETL, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.77 |
| Intersection Signal Delay (s/veh): | 34.0 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 66.8% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

Splits and Phases: 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.



| | |
|----------------------|----|
| Lane Group | Ø9 |
| Reduced v/c Ratio | |
| Intersection Summary | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 9: RT 3A/Hancock St. & Glover Ave.

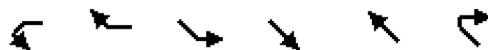
12/20/2023



| Lane Group | WBL | WBR | SEL | SET | NWT | NWR | Ø9 |
|----------------------------|-------|-------|-------|-------|-------|-------|----|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 80 | 100 | 2 | 254 | 611 | 0 | |
| Future Volume (vph) | 80 | 100 | 2 | 254 | 611 | 0 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Fr _t | 0.925 | | | | | | |
| Fl _t Protected | 0.978 | | | | | | |
| Satd. Flow (prot) | 1669 | 0 | 0 | 1845 | 1845 | 0 | |
| Fl _t Permitted | 0.978 | | | 0.998 | | | |
| Satd. Flow (perm) | 1669 | 0 | 0 | 1841 | 1845 | 0 | |
| Right Turn on Red | | Yes | | | | Yes | |
| Satd. Flow (RTOR) | 48 | | | | | | |
| Link Speed (mph) | 30 | | | 30 | 30 | | |
| Link Distance (ft) | 462 | | | 308 | 387 | | |
| Travel Time (s) | 10.5 | | | 7.0 | 8.8 | | |
| Peak Hour Factor | 0.64 | 0.64 | 0.82 | 0.82 | 0.86 | 0.86 | |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | |
| Adj. Flow (vph) | 125 | 156 | 2 | 310 | 710 | 0 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 281 | 0 | 0 | 312 | 710 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | |
| Median Width(ft) | 12 | | | 0 | 0 | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 | |
| Number of Detectors | 1 | | 1 | 2 | 2 | | |
| Detector Template | Left | | Left | Thru | Thru | | |
| Leading Detector (ft) | 20 | | 20 | 100 | 100 | | |
| Trailing Detector (ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Position(ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Size(ft) | 20 | | 20 | 6 | 6 | | |
| Detector 1 Type | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | | |
| Detector 1 Channel | | | | | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 2 Position(ft) | | | | 94 | 94 | | |
| Detector 2 Size(ft) | | | | 6 | 6 | | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | | |
| Turn Type | Prot | | Perm | NA | NA | | |
| Protected Phases | 8 | | | 6 | 2 | 9 | |
| Permitted Phases | | | 6 | | | | |
| Detector Phase | 8 | | 6 | 6 | 2 | | |
| Switch Phase | | | | | | | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 9: RT 3A/Hancock St. & Glover Ave.

12/20/2023



| Lane Group | WBL | WBR | SEL | SET | NWT | NWR | Ø9 |
|-------------------------|-------|-----|-------|-------|-------|-----|------|
| Minimum Initial (s) | 8.0 | | 10.0 | 10.0 | 10.0 | | 13.0 |
| Minimum Split (s) | 13.5 | | 15.0 | 15.0 | 23.0 | | 20.0 |
| Total Split (s) | 32.0 | | 68.0 | 68.0 | 68.0 | | 20.0 |
| Total Split (%) | 26.7% | | 56.7% | 56.7% | 56.7% | | 17% |
| Maximum Green (s) | 26.5 | | 63.0 | 63.0 | 63.0 | | 18.0 |
| Yellow Time (s) | 3.5 | | 4.0 | 4.0 | 4.0 | | 2.0 |
| All-Red Time (s) | 2.0 | | 1.0 | 1.0 | 1.0 | | 0.0 |
| Lost Time Adjust (s) | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.5 | | | 5.0 | 5.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 |
| Recall Mode | None | | C-Max | C-Max | C-Max | | None |
| Walk Time (s) | | | | | | | 7.0 |
| Flash Dont Walk (s) | | | | | | | 11.0 |
| Pedestrian Calls (#/hr) | | | | | | | 5 |
| Act Effct Green (s) | 21.5 | | | 84.0 | 84.0 | | |
| Actuated g/C Ratio | 0.18 | | | 0.70 | 0.70 | | |
| v/c Ratio | 0.83 | | | 0.24 | 0.55 | | |
| Control Delay (s/veh) | 59.5 | | | 9.1 | 13.4 | | |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | | |
| Total Delay (s/veh) | 59.5 | | | 9.1 | 13.4 | | |
| LOS | E | | | A | B | | |
| Approach Delay (s/veh) | 59.5 | | | 9.1 | 13.4 | | |
| Approach LOS | E | | | A | B | | |
| 90th %ile Green (s) | 26.5 | | 63.0 | 63.0 | 63.0 | | 18.0 |
| 90th %ile Term Code | Max | | Coord | Coord | Coord | | Ped |
| 70th %ile Green (s) | 25.8 | | 83.7 | 83.7 | 83.7 | | 0.0 |
| 70th %ile Term Code | Gap | | Coord | Coord | Coord | | Skip |
| 50th %ile Green (s) | 22.4 | | 87.1 | 87.1 | 87.1 | | 0.0 |
| 50th %ile Term Code | Gap | | Coord | Coord | Coord | | Skip |
| 30th %ile Green (s) | 18.9 | | 90.6 | 90.6 | 90.6 | | 0.0 |
| 30th %ile Term Code | Gap | | Coord | Coord | Coord | | Skip |
| 10th %ile Green (s) | 13.8 | | 95.7 | 95.7 | 95.7 | | 0.0 |
| 10th %ile Term Code | Gap | | Coord | Coord | Coord | | Skip |
| Stops (vph) | 144 | | | 94 | 310 | | |
| Fuel Used(gal) | 4 | | | 2 | 5 | | |
| CO Emissions (g/hr) | 253 | | | 172 | 365 | | |
| NOx Emissions (g/hr) | 49 | | | 34 | 71 | | |
| VOC Emissions (g/hr) | 59 | | | 40 | 85 | | |
| Dilemma Vehicles (#) | 0 | | | 0 | 0 | | |
| Queue Length 50th (ft) | 176 | | | 70 | 216 | | |
| Queue Length 95th (ft) | 164 | | | 173 | 520 | | |
| Internal Link Dist (ft) | 382 | | | 228 | 307 | | |
| Turn Bay Length (ft) | | | | | | | |
| Base Capacity (vph) | 405 | | | 1289 | 1291 | | |
| Starvation Cap Reductn | 0 | | | 0 | 0 | | |
| Spillback Cap Reductn | 0 | | | 0 | 0 | | |
| Storage Cap Reductn | 0 | | | 0 | 0 | | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 9: RT 3A/Hancock St. & Glover Ave.

12/20/2023

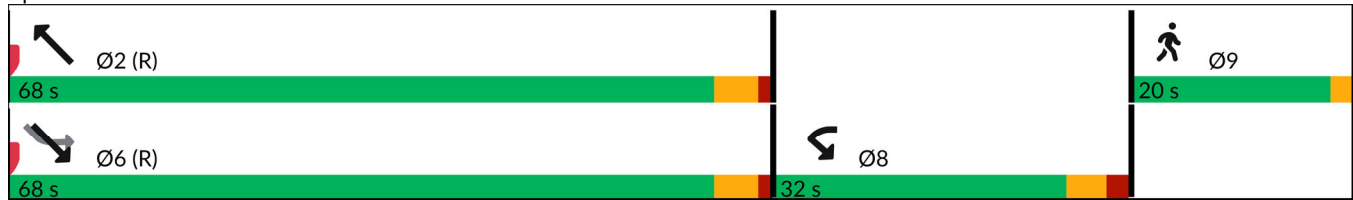


| Lane Group | WBL | WBR | SEL | SET | NWT | NWR | Ø9 |
|-------------------|------|-----|-----|------|------|-----|----|
| Reduced v/c Ratio | 0.69 | | | 0.24 | 0.55 | | |

Intersection Summary

| | |
|------------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 120 |
| Actuated Cycle Length: | 120 |
| Offset: | 0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green |
| Natural Cycle: | 80 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.83 |
| Intersection Signal Delay (s/veh): | 22.3 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 51.5% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 9: RT 3A/Hancock St. & Glover Ave.



TIP Before and After Evaluations - Quincy - Hancock Street AM
 11: McDonalds Drive Thru & RT 3A/Hancock St.

12/20/2023



| Lane Group | SET | SER | NWL | NWT | NEL | NER | Ø9 |
|----------------------------|-------|-------|-------|-------|-------|-------|----|
| Lane Configurations | ↑↑ | | | ↑↑ | ↑↑ | | |
| Traffic Volume (vph) | 370 | 35 | 85 | 698 | 108 | 93 | |
| Future Volume (vph) | 370 | 35 | 85 | 698 | 108 | 93 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | |
| Frt | 0.987 | | | | 0.937 | | |
| Flt Protected | | | | 0.995 | 0.974 | | |
| Satd. Flow (prot) | 3426 | 0 | 0 | 3454 | 1684 | 0 | |
| Flt Permitted | | | | 0.832 | 0.974 | | |
| Satd. Flow (perm) | 3426 | 0 | 0 | 2888 | 1684 | 0 | |
| Right Turn on Red | | Yes | | | | Yes | |
| Satd. Flow (RTOR) | 10 | | | | 33 | | |
| Link Speed (mph) | 30 | | | 30 | 30 | | |
| Link Distance (ft) | 554 | | | 320 | 131 | | |
| Travel Time (s) | 12.6 | | | 7.3 | 3.0 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 3% | 3% | |
| Adj. Flow (vph) | 402 | 38 | 92 | 759 | 117 | 101 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 440 | 0 | 0 | 851 | 218 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | |
| Median Width(ft) | 0 | | | 0 | 12 | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 | |
| Number of Detectors | 2 | | 1 | 2 | 1 | | |
| Detector Template | Thru | | Left | Thru | Left | | |
| Leading Detector (ft) | 100 | | 20 | 100 | 20 | | |
| Trailing Detector (ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Position(ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Size(ft) | 6 | | 20 | 6 | 20 | | |
| Detector 1 Type | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | | |
| Detector 1 Channel | | | | | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 2 Position(ft) | 94 | | | 94 | | | |
| Detector 2 Size(ft) | 6 | | | 6 | | | |
| Detector 2 Type | Cl+Ex | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | | |
| Turn Type | NA | | pm+pt | NA | Prot | | |
| Protected Phases | 2 | | 1 | 6 | 4 | 9 | |
| Permitted Phases | | | 6 | | | | |
| Detector Phase | 2 | | 1 | 6 | 4 | | |
| Switch Phase | | | | | | | |

TIP Before and After Evaluations - Quincy - Hancock Street AM
 11: McDonalds Drive Thru & RT 3A/Hancock St.

12/20/2023



| Lane Group | SET | SER | NWL | NWT | NEL | NER | Ø9 |
|-------------------------|-------|-----|------|-------|-------|-----|------|
| Minimum Initial (s) | 15.0 | | 7.0 | 15.0 | 7.0 | | 21.0 |
| Minimum Split (s) | 19.5 | | 11.5 | 19.5 | 12.0 | | 25.5 |
| Total Split (s) | 51.0 | | 11.5 | 62.5 | 32.0 | | 25.5 |
| Total Split (%) | 42.5% | | 9.6% | 52.1% | 26.7% | | 21% |
| Maximum Green (s) | 46.5 | | 7.0 | 58.0 | 27.0 | | 21.0 |
| Yellow Time (s) | 3.5 | | 3.0 | 3.5 | 3.0 | | 3.5 |
| All-Red Time (s) | 1.0 | | 1.5 | 1.0 | 2.0 | | 1.0 |
| Lost Time Adjust (s) | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 4.5 | | | 4.5 | 5.0 | | |
| Lead/Lag | Lead | | Lag | | | | |
| Lead-Lag Optimize? | Yes | | Yes | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 |
| Recall Mode | C-Max | | None | Max | None | | None |
| Act Effct Green (s) | 91.8 | | | 91.8 | 18.7 | | |
| Actuated g/C Ratio | 0.77 | | | 0.77 | 0.16 | | |
| v/c Ratio | 0.17 | | | 0.39 | 0.75 | | |
| Control Delay (s/veh) | 4.1 | | | 5.8 | 56.6 | | |
| Queue Delay | 0.0 | | | 1.4 | 0.0 | | |
| Total Delay (s/veh) | 4.1 | | | 7.2 | 56.6 | | |
| LOS | A | | | A | E | | |
| Approach Delay (s/veh) | 4.1 | | | 7.2 | 56.6 | | |
| Approach LOS | A | | | A | E | | |
| 90th %ile Green (s) | 84.5 | | 0.0 | 84.5 | 26.0 | | 0.0 |
| 90th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 70th %ile Green (s) | 88.8 | | 0.0 | 88.8 | 21.7 | | 0.0 |
| 70th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 50th %ile Green (s) | 91.8 | | 0.0 | 91.8 | 18.7 | | 0.0 |
| 50th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 30th %ile Green (s) | 94.8 | | 0.0 | 94.8 | 15.7 | | 0.0 |
| 30th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 10th %ile Green (s) | 99.3 | | 0.0 | 99.3 | 11.2 | | 0.0 |
| 10th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| Stops (vph) | 87 | | | 248 | 160 | | |
| Fuel Used(gal) | 3 | | | 4 | 3 | | |
| CO Emissions (g/hr) | 179 | | | 297 | 238 | | |
| NOx Emissions (g/hr) | 35 | | | 58 | 46 | | |
| VOC Emissions (g/hr) | 42 | | | 69 | 55 | | |
| Dilemma Vehicles (#) | 0 | | | 0 | 0 | | |
| Queue Length 50th (ft) | 40 | | | 97 | 139 | | |
| Queue Length 95th (ft) | 55 | | | 165 | 211 | | |
| Internal Link Dist (ft) | 474 | | | 240 | 51 | | |
| Turn Bay Length (ft) | | | | | | | |
| Base Capacity (vph) | 2624 | | | 2210 | 404 | | |
| Starvation Cap Reductn | 0 | | | 1101 | 0 | | |
| Spillback Cap Reductn | 0 | | | 0 | 0 | | |
| Storage Cap Reductn | 0 | | | 0 | 0 | | |
| Reduced v/c Ratio | 0.17 | | | 0.77 | 0.54 | | |

Intersection Summary

TIP Before and After Evaluations - Quincy - Hancock Street AM
 11: McDonalds Drive Thru & RT 3A/Hancock St.

12/20/2023













| | | | |
|------------------------------------|---|----------------------|---|
| Area Type: | Other | | |
| Cycle Length: | 120 | | |
| Actuated Cycle Length: | 120 | | |
| Offset: | 0 (0%), Referenced to phase 2:SET, Start of Green | | |
| Natural Cycle: | 70 | | |
| Control Type: | Actuated-Coordinated | | |
| Maximum v/c Ratio: | 0.75 | | |
| Intersection Signal Delay (s/veh): | 13.4 | Intersection LOS: | B |
| Intersection Capacity Utilization | 57.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

Splits and Phases: 11: McDonalds Drive Thru & RT 3A/Hancock St.



TIP Before and After Evaluations - Quincy - Hancock Street PM
 2: RT 3A/Hancock St./Hancock SB & Hunt St.













12/20/2023

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Lane Configurations | | ↑↑ | | | ↑↑ | | | ↑ | | | | |
| Traffic Volume (vph) | 32 | 633 | 20 | 21 | 517 | 32 | 16 | 1 | 13 | 0 | 0 | 0 |
| Future Volume (vph) | 32 | 633 | 20 | 21 | 517 | 32 | 16 | 1 | 13 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Fr _t | | 0.996 | | | 0.992 | | | 0.941 | | | | |
| Fl _t Protected | | 0.998 | | | 0.998 | | | 0.975 | | | | |
| Satd. Flow (prot) | 0 | 3450 | 0 | 0 | 3436 | 0 | 0 | 1692 | 0 | 0 | 0 | 0 |
| Fl _t Permitted | | 0.889 | | | 0.897 | | | 0.975 | | | | |
| Satd. Flow (perm) | 0 | 3074 | 0 | 0 | 3089 | 0 | 0 | 1692 | 0 | 0 | 0 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 5 | | | 9 | | | 20 | | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | | 30 |
| Link Distance (ft) | | 351 | | | 554 | | | 161 | | | | 233 |
| Travel Time (s) | | 8.0 | | | 12.6 | | | 3.7 | | | | 5.3 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.66 | 0.66 | 0.66 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 2% | 2% | 2% |
| Adj. Flow (vph) | 41 | 812 | 26 | 23 | 562 | 35 | 24 | 2 | 20 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 879 | 0 | 0 | 620 | 0 | 0 | 46 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | | | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | | | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | | | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | | | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | | | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | | | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | | | |
| Protected Phases | | 6 | | | 2 | | | 4 | | | | |
| Permitted Phases | 6 | | | 2 | | | 4 | | | | | |
| Detector Phase | 6 | 6 | | 2 | 2 | | 4 | 4 | | | | |
| Switch Phase | | | | | | | | | | | | |

| | |
|----------------------------|----|
| Lane Group | Ø9 |
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Lane Util. Factor | |
| Frnt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Heavy Vehicles (%) | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 2: RT 3A/Hancock St./Hancock SB & Hunt St.

12/20/2023

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Minimum Initial (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 7.0 | 7.0 | | | | |
| Minimum Split (s) | 19.0 | 19.0 | | 19.0 | 19.0 | | 13.5 | 13.5 | | | | |
| Total Split (s) | 81.0 | 81.0 | | 81.0 | 81.0 | | 19.0 | 19.0 | | | | |
| Total Split (%) | 67.5% | 67.5% | | 67.5% | 67.5% | | 15.8% | 15.8% | | | | |
| Maximum Green (s) | 73.0 | 73.0 | | 73.0 | 73.0 | | 13.0 | 13.0 | | | | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 3.5 | 3.5 | | | | |
| All-Red Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 2.5 | 2.5 | | | | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Total Lost Time (s) | | 8.0 | | | 8.0 | | | 6.0 | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | | | |
| Recall Mode | C-Max | C-Max | | C-Max | C-Max | | None | None | | | | |
| Act Effct Green (s) | | 102.1 | | | 102.1 | | | 8.1 | | | | |
| Actuated g/C Ratio | | 0.85 | | | 0.85 | | | 0.07 | | | | |
| v/c Ratio | | 0.34 | | | 0.24 | | | 0.35 | | | | |
| Control Delay (s/veh) | | 3.0 | | | 3.1 | | | 41.6 | | | | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Total Delay (s/veh) | | 3.0 | | | 3.1 | | | 41.6 | | | | |
| LOS | | A | | | A | | | D | | | | |
| Approach Delay (s/veh) | | 3.0 | | | 3.1 | | | 41.6 | | | | |
| Approach LOS | | A | | | A | | | D | | | | |
| 90th %ile Green (s) | 95.4 | 95.4 | | 95.4 | 95.4 | | 10.6 | 10.6 | | | | |
| 90th %ile Term Code | Coord | Coord | | Coord | Coord | | Gap | Gap | | | | |
| 70th %ile Green (s) | 97.3 | 97.3 | | 97.3 | 97.3 | | 8.7 | 8.7 | | | | |
| 70th %ile Term Code | Coord | Coord | | Coord | Coord | | Gap | Gap | | | | |
| 50th %ile Green (s) | 98.7 | 98.7 | | 98.7 | 98.7 | | 7.3 | 7.3 | | | | |
| 50th %ile Term Code | Coord | Coord | | Coord | Coord | | Gap | Gap | | | | |
| 30th %ile Green (s) | 99.0 | 99.0 | | 99.0 | 99.0 | | 7.0 | 7.0 | | | | |
| 30th %ile Term Code | Coord | Coord | | Coord | Coord | | Min | Min | | | | |
| 10th %ile Green (s) | 112.0 | 112.0 | | 112.0 | 112.0 | | 0.0 | 0.0 | | | | |
| 10th %ile Term Code | Coord | Coord | | Coord | Coord | | Skip | Skip | | | | |
| Stops (vph) | | 137 | | | 119 | | | 19 | | | | |
| Fuel Used(gal) | | 3 | | | 3 | | | 0 | | | | |
| CO Emissions (g/hr) | | 213 | | | 243 | | | 28 | | | | |
| NOx Emissions (g/hr) | | 41 | | | 47 | | | 5 | | | | |
| VOC Emissions (g/hr) | | 49 | | | 56 | | | 6 | | | | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | | |
| Queue Length 50th (ft) | | 68 | | | 65 | | | 20 | | | | |
| Queue Length 95th (ft) | | 85 | | | 78 | | | 38 | | | | |
| Internal Link Dist (ft) | | 271 | | | 474 | | | 81 | | | 153 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 2615 | | | 2629 | | | 201 | | | | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | | |
| Reduced v/c Ratio | | 0.34 | | | 0.24 | | | 0.23 | | | | |
| Intersection Summary | | | | | | | | | | | | |

| | |
|-----------------------------|------|
| Lane Group | Ø9 |
| Minimum Initial (s) | 16.0 |
| Minimum Split (s) | 20.0 |
| Total Split (s) | 20.0 |
| Total Split (%) | 17% |
| Maximum Green (s) | 16.0 |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 2.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay (s/veh) | |
| Queue Delay | |
| Total Delay (s/veh) | |
| LOS | |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 0.0 |
| 90th %ile Term Code | Skip |
| 70th %ile Green (s) | 0.0 |
| 70th %ile Term Code | Skip |
| 50th %ile Green (s) | 0.0 |
| 50th %ile Term Code | Skip |
| 30th %ile Green (s) | 0.0 |
| 30th %ile Term Code | Skip |
| 10th %ile Green (s) | 0.0 |
| 10th %ile Term Code | Skip |
| Stops (vph) | |
| Fuel Used(gal) | |
| CO Emissions (g/hr) | |
| NOx Emissions (g/hr) | |
| VOC Emissions (g/hr) | |
| Dilemma Vehicles (#) | |
| Queue Length 50th (ft) | |
| Queue Length 95th (ft) | |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |
| Reduced v/c Ratio | |
| Intersection Summary | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 2: RT 3A/Hancock St./Hancock SB & Hunt St.

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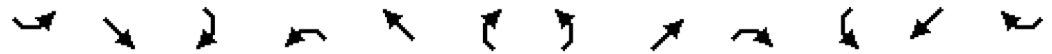
| | | |
|------------------------------------|---|------------------------|
| Area Type: | Other | |
| Cycle Length: | 120 | |
| Actuated Cycle Length: | 120 | |
| Offset: | 0 (0%), Referenced to phase 2:NWTL and 6:SETL, Start of Green | |
| Natural Cycle: | 60 | |
| Control Type: | Actuated-Coordinated | |
| Maximum v/c Ratio: | 0.35 | |
| Intersection Signal Delay (s/veh): | 4.2 | Intersection LOS: A |
| Intersection Capacity Utilization | 59.1% | ICU Level of Service B |
| Analysis Period (min) | 15 | |

Splits and Phases: 2: RT 3A/Hancock St./Hancock SB & Hunt St.



TIP Before and After Evaluations - Quincy - Hancock Street PM
 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.

12/20/2023



| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↑↑ | ↑ | ↑ | ↑↑ | | ↑ | ↑ | | ↑ | ↑↑ | ↑ |
| Traffic Volume (vph) | 50 | 393 | 232 | 158 | 347 | 60 | 218 | 309 | 80 | 41 | 204 | 64 |
| Future Volume (vph) | 50 | 393 | 232 | 158 | 347 | 60 | 218 | 309 | 80 | 41 | 204 | 64 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 175 | 145 | | 245 | 0 | | 0 | 300 | | 200 |
| Storage Lanes | 0 | | 1 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.978 | | | 0.969 | | | | 0.850 |
| Flt Protected | | 0.994 | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 3450 | 1553 | 1736 | 3395 | 0 | 1752 | 1787 | 0 | 1752 | 3505 | 1568 |
| Flt Permitted | | 0.834 | | 0.415 | | | 0.325 | | | 0.450 | | |
| Satd. Flow (perm) | 0 | 2895 | 1553 | 758 | 3395 | 0 | 600 | 1787 | 0 | 830 | 3505 | 1568 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 242 | | 15 | | | 11 | | | | 142 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | | 30 |
| Link Distance (ft) | | 320 | | | 429 | | | 622 | | | | 589 |
| Travel Time (s) | | 7.3 | | | 9.8 | | | 14.1 | | | | 13.4 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.91 | 0.91 | 0.91 | 0.88 | 0.88 | 0.88 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 3% | 3% | 3% | 3% | 3% | 3% |
| Adj. Flow (vph) | 54 | 427 | 252 | 174 | 381 | 66 | 248 | 351 | 91 | 49 | 246 | 77 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 481 | 252 | 174 | 447 | 0 | 248 | 442 | 0 | 49 | 246 | 77 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | | 12 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | | Left | Thru | | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | Perm | NA | Prot | pm+pt | NA | | pm+pt | NA | | Perm | NA | Prot |
| Protected Phases | | 6 | 6 | 5 | 2 | | 7 | 4 | | | 8 | 8 |

| | |
|----------------------------|----|
| Lane Group | Ø9 |
| Lane Configurations | |
| Traffic Volume (vph) | |
| Future Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (ft) | |
| Storage Lanes | |
| Taper Length (ft) | |
| Lane Util. Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Heavy Vehicles (%) | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 9 |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.

12/20/2023



| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------------|-------|-------|-------|-------|-------|-----|-------|-------|-----|-------|-------|-------|
| Permitted Phases | 6 | | | 2 | | | 4 | | | 8 | | |
| Detector Phase | 6 | 6 | 6 | 5 | 2 | | 7 | 4 | | 8 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 9.0 | 9.0 | 9.0 | 6.0 | 11.0 | | 7.0 | 10.0 | | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.5 | 15.5 | 15.5 | 11.5 | 16.5 | | 11.5 | 15.5 | | 15.5 | 15.5 | 15.5 |
| Total Split (s) | 37.8 | 37.8 | 37.8 | 21.2 | 59.0 | | 34.0 | 67.0 | | 33.0 | 33.0 | 33.0 |
| Total Split (%) | 25.2% | 25.2% | 25.2% | 14.1% | 39.3% | | 22.7% | 44.7% | | 22.0% | 22.0% | 22.0% |
| Maximum Green (s) | 31.3 | 31.3 | 31.3 | 15.7 | 53.5 | | 29.5 | 61.5 | | 27.5 | 27.5 | 27.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 3.5 | 4.5 | | 3.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 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) | | 6.5 | 6.5 | 5.5 | 5.5 | | 4.5 | 5.5 | | 5.5 | 5.5 | 5.5 |
| Lead/Lag | Lag | Lag | Lag | Lead | | | Lead | | | Lag | Lag | Lag |
| 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 | 3.0 |
| Recall Mode | C-Max | C-Max | C-Max | None | C-Max | | None | None | | None | None | None |
| Act Effct Green (s) | | 77.2 | 77.2 | 95.6 | 95.6 | | 44.4 | 43.4 | | 16.0 | 16.0 | 16.0 |
| Actuated g/C Ratio | | 0.51 | 0.51 | 0.64 | 0.64 | | 0.30 | 0.29 | | 0.11 | 0.11 | 0.11 |
| v/c Ratio | | 0.32 | 0.28 | 0.31 | 0.21 | | 0.70 | 0.84 | | 0.56 | 0.66 | 0.26 |
| Control Delay (s/veh) | | 23.9 | 4.3 | 13.9 | 12.2 | | 53.2 | 63.1 | | 86.1 | 72.6 | 2.2 |
| Queue Delay | | 1.5 | 1.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 25.4 | 5.3 | 13.9 | 12.2 | | 53.2 | 63.1 | | 86.1 | 72.6 | 2.2 |
| LOS | | C | A | B | B | | D | E | | F | E | A |
| Approach Delay (s/veh) | | 18.5 | | | 12.6 | | 59.5 | | | 59.8 | | |
| Approach LOS | | B | | | B | | E | | | E | | |
| 90th %ile Green (s) | 60.9 | 60.9 | 60.9 | 16.9 | 84.3 | | 29.1 | 54.7 | | 21.1 | 21.1 | 21.1 |
| 90th %ile Term Code | Coord | Coord | Coord | Gap | Coord | | Gap | Hold | | Gap | Gap | Gap |
| 70th %ile Green (s) | 71.6 | 71.6 | 71.6 | 13.4 | 91.5 | | 25.5 | 47.5 | | 17.5 | 17.5 | 17.5 |
| 70th %ile Term Code | Coord | Coord | Coord | Gap | Coord | | Gap | Hold | | Gap | Gap | Gap |
| 50th %ile Green (s) | 77.6 | 77.6 | 77.6 | 11.5 | 95.6 | | 23.1 | 43.4 | | 15.8 | 15.8 | 15.8 |
| 50th %ile Term Code | Coord | Coord | Coord | Gap | Coord | | Gap | Hold | | Gap | Gap | Gap |
| 30th %ile Green (s) | 83.7 | 83.7 | 83.7 | 9.8 | 100.0 | | 20.4 | 39.0 | | 14.1 | 14.1 | 14.1 |
| 30th %ile Term Code | Coord | Coord | Coord | Gap | Coord | | Gap | Hold | | Gap | Gap | Gap |
| 10th %ile Green (s) | 92.0 | 92.0 | 92.0 | 7.9 | 106.4 | | 16.5 | 32.6 | | 11.6 | 11.6 | 11.6 |
| 10th %ile Term Code | Coord | Coord | Coord | Gap | Coord | | Gap | Hold | | Gap | Gap | Gap |
| Stops (vph) | | 258 | 20 | 64 | 162 | | 174 | 349 | | 39 | 192 | 0 |
| Fuel Used(gal) | | 5 | 1 | 2 | 4 | | 4 | 9 | | 1 | 5 | 0 |
| CO Emissions (g/hr) | | 328 | 62 | 119 | 297 | | 306 | 616 | | 78 | 350 | 23 |
| NOx Emissions (g/hr) | | 64 | 12 | 23 | 58 | | 60 | 120 | | 15 | 68 | 4 |
| VOC Emissions (g/hr) | | 76 | 14 | 28 | 69 | | 71 | 143 | | 18 | 81 | 5 |
| Dilemma Vehicles (#) | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 |
| Queue Length 50th (ft) | | 140 | 5 | 65 | 87 | | 200 | 399 | | 46 | 124 | 0 |
| Queue Length 95th (ft) | | 226 | 62 | 122 | 140 | | 249 | 467 | | 83 | 152 | 0 |
| Internal Link Dist (ft) | | 240 | | | 349 | | | 542 | | | 509 | |
| Turn Bay Length (ft) | | | 175 | 145 | | | | | | 300 | | 200 |
| Base Capacity (vph) | | 1489 | 916 | 586 | 2168 | | 404 | 739 | | 152 | 642 | 403 |
| Starvation Cap Reductn | | 787 | 434 | 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 |

| | |
|-------------------------|------|
| Lane Group | Ø9 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 16.5 |
| Minimum Split (s) | 24.0 |
| Total Split (s) | 24.0 |
| Total Split (%) | 16% |
| Maximum Green (s) | 18.0 |
| Yellow Time (s) | 2.0 |
| All-Red Time (s) | 4.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay (s/veh) | |
| Queue Delay | |
| Total Delay (s/veh) | |
| LOS | |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 0.0 |
| 90th %ile Term Code | Skip |
| 70th %ile Green (s) | 0.0 |
| 70th %ile Term Code | Skip |
| 50th %ile Green (s) | 0.0 |
| 50th %ile Term Code | Skip |
| 30th %ile Green (s) | 0.0 |
| 30th %ile Term Code | Skip |
| 10th %ile Green (s) | 0.0 |
| 10th %ile Term Code | Skip |
| Stops (vph) | |
| Fuel Used(gal) | |
| CO Emissions (g/hr) | |
| NOx Emissions (g/hr) | |
| VOC Emissions (g/hr) | |
| Dilemma Vehicles (#) | |
| Queue Length 50th (ft) | |
| Queue Length 95th (ft) | |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | |
| Starvation Cap Reductn | |
| Spillback Cap Reductn | |
| Storage Cap Reductn | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.

12/20/2023

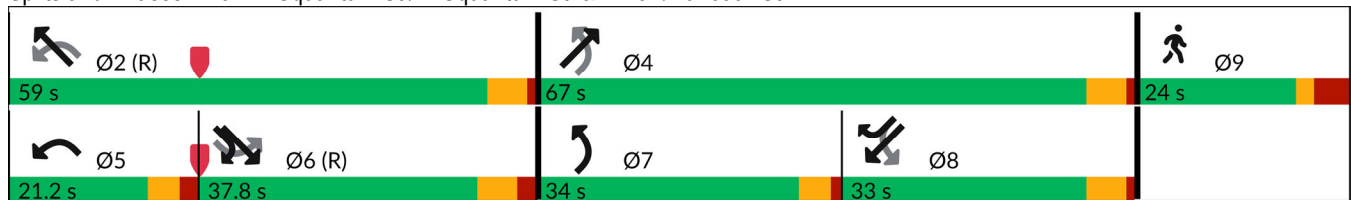


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------|-----|------|------|------|------|-----|------|------|-----|------|------|------|
| Reduced v/c Ratio | | 0.69 | 0.52 | 0.30 | 0.21 | | 0.61 | 0.60 | | 0.32 | 0.38 | 0.19 |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:NWTL and 6:SETL, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.84 |
| Intersection Signal Delay (s/veh): | 35.1 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 72.4% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

Splits and Phases: 3: W. Squantum St./E. Squantum St. & RT 3A/Hancock St.



| | |
|----------------------|----|
| Lane Group | Ø9 |
| Reduced v/c Ratio | |
| Intersection Summary | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 9: RT 3A/Hancock St. & Glover Ave.

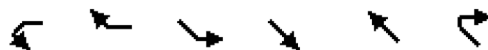
12/20/2023



| Lane Group | WBL | WBR | SEL | SET | NWT | NWR | Ø9 |
|----------------------------|-------|-------|-------|-------|-------|-------|----|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 18 | 44 | 23 | 448 | 521 | 7 | |
| Future Volume (vph) | 18 | 44 | 23 | 448 | 521 | 7 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 0.904 | | | | 0.998 | | |
| Flt Protected | 0.986 | | | 0.998 | | | |
| Satd. Flow (prot) | 1644 | 0 | 0 | 1841 | 1841 | 0 | |
| Flt Permitted | 0.986 | | | 0.956 | | | |
| Satd. Flow (perm) | 1644 | 0 | 0 | 1763 | 1841 | 0 | |
| Right Turn on Red | | Yes | | | | Yes | |
| Satd. Flow (RTOR) | 69 | | | | 1 | | |
| Link Speed (mph) | 30 | | | 30 | 30 | | |
| Link Distance (ft) | 462 | | | 308 | 387 | | |
| Travel Time (s) | 10.5 | | | 7.0 | 8.8 | | |
| Peak Hour Factor | 0.64 | 0.64 | 0.82 | 0.82 | 0.86 | 0.86 | |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | |
| Adj. Flow (vph) | 28 | 69 | 28 | 546 | 606 | 8 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 97 | 0 | 0 | 574 | 614 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | |
| Median Width(ft) | 12 | | | 0 | 0 | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 | |
| Number of Detectors | 1 | | 1 | 2 | 2 | | |
| Detector Template | Left | | Left | Thru | Thru | | |
| Leading Detector (ft) | 20 | | 20 | 100 | 100 | | |
| Trailing Detector (ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Position(ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Size(ft) | 20 | | 20 | 6 | 6 | | |
| Detector 1 Type | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | | |
| Detector 1 Channel | | | | | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 2 Position(ft) | | | | 94 | 94 | | |
| Detector 2 Size(ft) | | | | 6 | 6 | | |
| Detector 2 Type | | | | Cl+Ex | Cl+Ex | | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | 0.0 | | |
| Turn Type | Prot | | Perm | NA | NA | | |
| Protected Phases | 8 | | | 6 | 2 | 9 | |
| Permitted Phases | | | 6 | | | | |
| Detector Phase | 8 | | 6 | 6 | 2 | | |
| Switch Phase | | | | | | | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 9: RT 3A/Hancock St. & Glover Ave.

12/20/2023



| Lane Group | WBL | WBR | SEL | SET | NWT | NWR | Ø9 |
|-------------------------|-------|-----|-------|-------|-------|-----|------|
| Minimum Initial (s) | 8.0 | | 10.0 | 10.0 | 10.0 | | 13.0 |
| Minimum Split (s) | 13.5 | | 15.0 | 15.0 | 23.0 | | 20.0 |
| Total Split (s) | 32.0 | | 68.0 | 68.0 | 68.0 | | 20.0 |
| Total Split (%) | 26.7% | | 56.7% | 56.7% | 56.7% | | 17% |
| Maximum Green (s) | 26.5 | | 63.0 | 63.0 | 63.0 | | 18.0 |
| Yellow Time (s) | 3.5 | | 4.0 | 4.0 | 4.0 | | 2.0 |
| All-Red Time (s) | 2.0 | | 1.0 | 1.0 | 1.0 | | 0.0 |
| Lost Time Adjust (s) | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 5.5 | | | 5.0 | 5.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 |
| Recall Mode | None | | C-Max | C-Max | C-Max | | None |
| Walk Time (s) | | | | | | | 7.0 |
| Flash Dont Walk (s) | | | | | | | 11.0 |
| Pedestrian Calls (#/hr) | | | | | | | 5 |
| Act Effct Green (s) | 9.3 | | | 96.2 | 96.2 | | |
| Actuated g/C Ratio | 0.08 | | | 0.80 | 0.80 | | |
| v/c Ratio | 0.51 | | | 0.41 | 0.42 | | |
| Control Delay (s/veh) | 28.8 | | | 6.0 | 6.0 | | |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | | |
| Total Delay (s/veh) | 28.8 | | | 6.0 | 6.0 | | |
| LOS | C | | | A | A | | |
| Approach Delay (s/veh) | 28.8 | | | 6.0 | 6.0 | | |
| Approach LOS | C | | | A | A | | |
| 90th %ile Green (s) | 12.7 | | 76.8 | 76.8 | 76.8 | | 18.0 |
| 90th %ile Term Code | Gap | | Coord | Coord | Coord | | Ped |
| 70th %ile Green (s) | 9.6 | | 99.9 | 99.9 | 99.9 | | 0.0 |
| 70th %ile Term Code | Gap | | Coord | Coord | Coord | | Skip |
| 50th %ile Green (s) | 8.0 | | 101.5 | 101.5 | 101.5 | | 0.0 |
| 50th %ile Term Code | Min | | Coord | Coord | Coord | | Skip |
| 30th %ile Green (s) | 8.0 | | 101.5 | 101.5 | 101.5 | | 0.0 |
| 30th %ile Term Code | Min | | Coord | Coord | Coord | | Skip |
| 10th %ile Green (s) | 8.0 | | 101.5 | 101.5 | 101.5 | | 0.0 |
| 10th %ile Term Code | Min | | Coord | Coord | Coord | | Skip |
| Stops (vph) | 22 | | | 139 | 157 | | |
| Fuel Used(gal) | 1 | | | 4 | 3 | | |
| CO Emissions (g/hr) | 50 | | | 283 | 217 | | |
| NOx Emissions (g/hr) | 10 | | | 55 | 42 | | |
| VOC Emissions (g/hr) | 11 | | | 66 | 50 | | |
| Dilemma Vehicles (#) | 0 | | | 0 | 0 | | |
| Queue Length 50th (ft) | 21 | | | 74 | 80 | | |
| Queue Length 95th (ft) | 36 | | | 265 | 305 | | |
| Internal Link Dist (ft) | 382 | | | 228 | 307 | | |
| Turn Bay Length (ft) | | | | | | | |
| Base Capacity (vph) | 416 | | | 1414 | 1476 | | |
| Starvation Cap Reductn | 0 | | | 0 | 0 | | |
| Spillback Cap Reductn | 0 | | | 0 | 0 | | |
| Storage Cap Reductn | 0 | | | 0 | 0 | | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 9: RT 3A/Hancock St. & Glover Ave.

12/20/2023

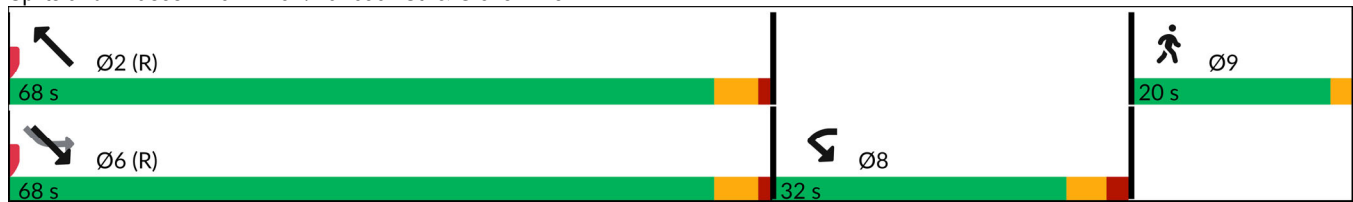


| Lane Group | WBL | WBR | SEL | SET | NWT | NWR | Ø9 |
|-------------------|------|-----|-----|------|------|-----|----|
| Reduced v/c Ratio | 0.23 | | | 0.41 | 0.42 | | |

Intersection Summary

| | |
|------------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 120 |
| Actuated Cycle Length: | 120 |
| Offset: | 0 (0%), Referenced to phase 2:NWT and 6:SETL, Start of Green |
| Natural Cycle: | 65 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.51 |
| Intersection Signal Delay (s/veh): | 7.7 |
| Intersection LOS: | A |
| Intersection Capacity Utilization | 57.7% |
| ICU Level of Service | B |
| Analysis Period (min) | 15 |

Splits and Phases: 9: RT 3A/Hancock St. & Glover Ave.



TIP Before and After Evaluations - Quincy - Hancock Street PM
 11: McDonalds Drive Thru & RT 3A/Hancock St.

12/20/2023



| Lane Group | SET | SER | NWL | NWT | NEL | NER | Ø9 |
|----------------------------|-------|-------|-------|-------|-------|-------|----|
| Lane Configurations | ↑↑ | | | ↑↑ | ↑↑ | | |
| Traffic Volume (vph) | 587 | 52 | 213 | 416 | 152 | 88 | |
| Future Volume (vph) | 587 | 52 | 213 | 416 | 152 | 88 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | |
| Frt | 0.988 | | | | 0.950 | | |
| Flt Protected | | | | 0.983 | 0.969 | | |
| Satd. Flow (prot) | 3429 | 0 | 0 | 3412 | 1698 | 0 | |
| Flt Permitted | | | | 0.600 | 0.969 | | |
| Satd. Flow (perm) | 3429 | 0 | 0 | 2083 | 1698 | 0 | |
| Right Turn on Red | | Yes | | | | Yes | |
| Satd. Flow (RTOR) | 9 | | | | 23 | | |
| Link Speed (mph) | 30 | | | 30 | 30 | | |
| Link Distance (ft) | 554 | | | 320 | 131 | | |
| Travel Time (s) | 12.6 | | | 7.3 | 3.0 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 3% | 3% | |
| Adj. Flow (vph) | 638 | 57 | 232 | 452 | 165 | 96 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 695 | 0 | 0 | 684 | 261 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | |
| Median Width(ft) | 0 | | | 0 | 12 | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 | |
| Number of Detectors | 2 | | 1 | 2 | 1 | | |
| Detector Template | Thru | | Left | Thru | Left | | |
| Leading Detector (ft) | 100 | | 20 | 100 | 20 | | |
| Trailing Detector (ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Position(ft) | 0 | | 0 | 0 | 0 | | |
| Detector 1 Size(ft) | 6 | | 20 | 6 | 20 | | |
| Detector 1 Type | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | | |
| Detector 1 Channel | | | | | | | |
| Detector 1 Extend (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Queue (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 1 Delay (s) | 0.0 | | 0.0 | 0.0 | 0.0 | | |
| Detector 2 Position(ft) | 94 | | | 94 | | | |
| Detector 2 Size(ft) | 6 | | | 6 | | | |
| Detector 2 Type | Cl+Ex | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | | |
| Turn Type | NA | | pm+pt | NA | Prot | | |
| Protected Phases | 2 | | 1 | 6 | 4 | 9 | |
| Permitted Phases | | | 6 | | | | |
| Detector Phase | 2 | | 1 | 6 | 4 | | |
| Switch Phase | | | | | | | |

TIP Before and After Evaluations - Quincy - Hancock Street PM
 11: McDonalds Drive Thru & RT 3A/Hancock St.

12/20/2023



| Lane Group | SET | SER | NWL | NWT | NEL | NER | Ø9 |
|-------------------------|-------|-----|------|-------|-------|-----|------|
| Minimum Initial (s) | 15.0 | | 7.0 | 15.0 | 7.0 | | 21.0 |
| Minimum Split (s) | 19.5 | | 11.5 | 19.5 | 12.0 | | 25.5 |
| Total Split (s) | 51.0 | | 11.5 | 62.5 | 32.0 | | 25.5 |
| Total Split (%) | 42.5% | | 9.6% | 52.1% | 26.7% | | 21% |
| Maximum Green (s) | 46.5 | | 7.0 | 58.0 | 27.0 | | 21.0 |
| Yellow Time (s) | 3.5 | | 3.0 | 3.5 | 3.0 | | 3.5 |
| All-Red Time (s) | 1.0 | | 1.5 | 1.0 | 2.0 | | 1.0 |
| Lost Time Adjust (s) | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 4.5 | | | 4.5 | 5.0 | | |
| Lead/Lag | Lead | | Lag | | | | |
| Lead-Lag Optimize? | Yes | | Yes | | | | |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 |
| Recall Mode | C-Max | | None | Max | None | | None |
| Act Effct Green (s) | 88.9 | | | 88.9 | 21.6 | | |
| Actuated g/C Ratio | 0.74 | | | 0.74 | 0.18 | | |
| v/c Ratio | 0.27 | | | 0.44 | 0.81 | | |
| Control Delay (s/veh) | 5.0 | | | 7.7 | 61.4 | | |
| Queue Delay | 0.0 | | | 1.4 | 0.0 | | |
| Total Delay (s/veh) | 5.0 | | | 9.0 | 61.4 | | |
| LOS | A | | | A | E | | |
| Approach Delay (s/veh) | 5.0 | | | 9.0 | 61.4 | | |
| Approach LOS | A | | | A | E | | |
| 90th %ile Green (s) | 83.5 | | 0.0 | 83.5 | 27.0 | | 0.0 |
| 90th %ile Term Code | Coord | | Skip | Coord | Max | | Skip |
| 70th %ile Green (s) | 85.1 | | 0.0 | 85.1 | 25.4 | | 0.0 |
| 70th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 50th %ile Green (s) | 88.3 | | 0.0 | 88.3 | 22.2 | | 0.0 |
| 50th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 30th %ile Green (s) | 91.5 | | 0.0 | 91.5 | 19.0 | | 0.0 |
| 30th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| 10th %ile Green (s) | 96.2 | | 0.0 | 96.2 | 14.3 | | 0.0 |
| 10th %ile Term Code | Coord | | Skip | Coord | Gap | | Skip |
| Stops (vph) | 145 | | | 235 | 207 | | |
| Fuel Used(gal) | 4 | | | 4 | 4 | | |
| CO Emissions (g/hr) | 294 | | | 269 | 307 | | |
| NOx Emissions (g/hr) | 57 | | | 52 | 60 | | |
| VOC Emissions (g/hr) | 68 | | | 62 | 71 | | |
| Dilemma Vehicles (#) | 0 | | | 0 | 0 | | |
| Queue Length 50th (ft) | 68 | | | 95 | 178 | | |
| Queue Length 95th (ft) | 84 | | | 153 | 263 | | |
| Internal Link Dist (ft) | 474 | | | 240 | 51 | | |
| Turn Bay Length (ft) | | | | | | | |
| Base Capacity (vph) | 2543 | | | 1543 | 399 | | |
| Starvation Cap Reductn | 0 | | | 620 | 0 | | |
| Spillback Cap Reductn | 0 | | | 0 | 0 | | |
| Storage Cap Reductn | 0 | | | 0 | 0 | | |
| Reduced v/c Ratio | 0.27 | | | 0.74 | 0.65 | | |

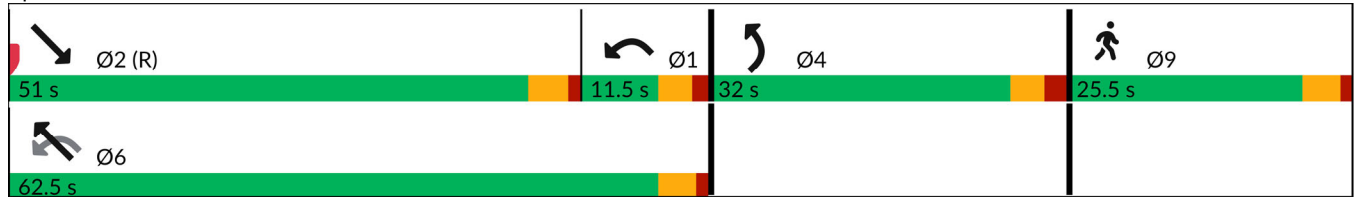
Intersection Summary

TIP Before and After Evaluations - Quincy - Hancock Street PM
 11: McDonalds Drive Thru & RT 3A/Hancock St.

12/20/2023

| | | | |
|------------------------------------|---|----------------------|---|
| Area Type: | Other | | |
| Cycle Length: | 120 | | |
| Actuated Cycle Length: | 120 | | |
| Offset: | 0 (0%), Referenced to phase 2:SET, Start of Green | | |
| Natural Cycle: | 80 | | |
| Control Type: | Actuated-Coordinated | | |
| Maximum v/c Ratio: | 0.81 | | |
| Intersection Signal Delay (s/veh): | 15.7 | Intersection LOS: | B |
| Intersection Capacity Utilization | 61.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

Splits and Phases: 11: McDonalds Drive Thru & RT 3A/Hancock St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 3: Grove St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↔ | | | ↔ | | | ↔ | | | ↔ | |
| Traffic Volume (vph) | 33 | 64 | 25 | 57 | 118 | 23 | 78 | 476 | 17 | 16 | 541 | 69 |
| Future Volume (vph) | 33 | 64 | 25 | 57 | 118 | 23 | 78 | 476 | 17 | 16 | 541 | 69 |
| 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 |
| Fr _t | | 0.973 | | | 0.984 | | | 0.996 | | | 0.985 | |
| Fl _t Protected | | 0.987 | | | 0.986 | | | 0.993 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1721 | 0 | 0 | 1807 | 0 | 0 | 1861 | 0 | 0 | 1851 | 0 |
| Fl _t Permitted | | 0.752 | | | 0.800 | | | 0.833 | | | 0.977 | |
| Satd. Flow (perm) | 0 | 1312 | 0 | 0 | 1466 | 0 | 0 | 1561 | 0 | 0 | 1810 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 14 | | | 7 | | | 4 | | | 14 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 324 | | | 398 | | | 212 | | | 301 | |
| Travel Time (s) | | 7.4 | | | 9.0 | | | 4.8 | | | 6.8 | |
| Peak Hour Factor | 0.65 | 0.65 | 0.65 | 0.72 | 0.72 | 0.72 | 0.82 | 0.82 | 0.82 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| Adj. Flow (vph) | 51 | 98 | 38 | 79 | 164 | 32 | 95 | 580 | 21 | 18 | 595 | 76 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 187 | 0 | 0 | 275 | 0 | 0 | 696 | 0 | 0 | 689 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 3: Grove St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 37.0 | 37.0 | | 37.0 | 37.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 43.0 | 43.0 | | 43.0 | 43.0 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 62.0 | 62.0 | | 62.0 | 62.0 | |
| Total Split (%) | 29.5% | 29.5% | | 29.5% | 29.5% | | 70.5% | 70.5% | | 70.5% | 70.5% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 18.6 | | | 18.6 | | | 57.4 | | | 57.4 | |
| Actuated g/C Ratio | | 0.21 | | | 0.21 | | | 0.65 | | | 0.65 | |
| v/c Ratio | | 0.65 | | | 0.87 | | | 0.68 | | | 0.58 | |
| Control Delay (s/veh) | | 40.2 | | | 60.2 | | | 14.4 | | | 11.2 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.4 | |
| Total Delay (s/veh) | | 40.2 | | | 60.2 | | | 14.4 | | | 11.6 | |
| LOS | | D | | | E | | | B | | | B | |
| Approach Delay (s/veh) | | 40.2 | | | 60.2 | | | 14.4 | | | 11.6 | |
| Approach LOS | | D | | | E | | | B | | | B | |
| 90th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 90th %ile Term Code | Max | Max | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 70th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 50th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 18.9 | 18.9 | | 18.9 | 18.9 | | 57.1 | 57.1 | | 57.1 | 57.1 | |
| 30th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 14.3 | 14.3 | | 14.3 | 14.3 | | 61.7 | 61.7 | | 61.7 | 61.7 | |
| 10th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 101 | | | 172 | | | 354 | | | 334 | |
| Fuel Used(gal) | | 2 | | | 4 | | | 5 | | | 5 | |
| CO Emissions (g/hr) | | 130 | | | 279 | | | 319 | | | 332 | |
| NOx Emissions (g/hr) | | 25 | | | 54 | | | 62 | | | 65 | |
| VOC Emissions (g/hr) | | 30 | | | 65 | | | 74 | | | 77 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 86 | | | 142 | | | 226 | | | 196 | |
| Queue Length 95th (ft) | | 103 | | | 174 | | | 294 | | | 296 | |
| Internal Link Dist (ft) | | 244 | | | 318 | | | 132 | | | 221 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 309 | | | 338 | | | 1018 | | | 1184 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 146 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM

3: Grove St. & Lebanon St.

01/23/2024

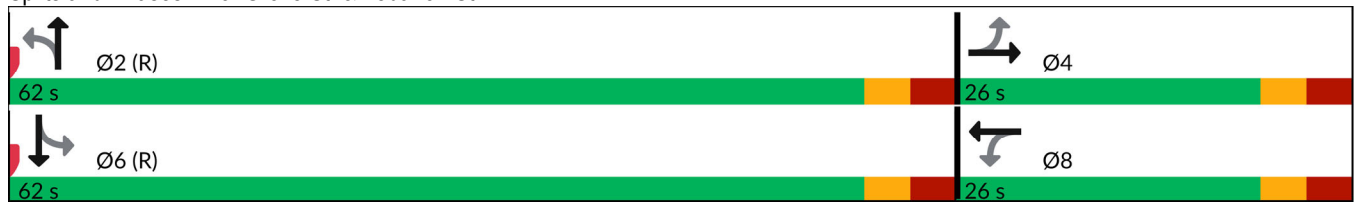


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 0.61 | | | 0.81 | | | 0.68 | | | 0.66 | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 88 |
| Actuated Cycle Length: | 88 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.87 |
| Intersection Signal Delay (s/veh): | 22.8 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 90.4% |
| ICU Level of Service | E |
| Analysis Period (min) | 15 |

Splits and Phases: 3: Grove St. & Lebanon St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 6: Lebanon St. & Laurel St.

01/23/2024



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 70 | 53 | 458 | 5 | 6 | 556 |
| Future Volume (vph) | 70 | 53 | 458 | 5 | 6 | 556 |
| Ideal Flow (vphp) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.942 | | 0.999 | | | |
| Flt Protected | 0.972 | | | | | 0.999 |
| Satd. Flow (prot) | 1706 | 0 | 1861 | 0 | 0 | 1861 |
| Flt Permitted | 0.972 | | | | | 0.999 |
| Satd. Flow (perm) | 1706 | 0 | 1861 | 0 | 0 | 1861 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 305 | | 301 | | | 343 |
| Travel Time (s) | 5.9 | | 6.0 | | | 8.2 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 76 | 58 | 498 | 5 | 7 | 604 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 134 | 0 | 503 | 0 | 0 | 611 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Stop | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 47.8% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 8: E. Foster St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Volume (vph) | 18 | 61 | 39 | 8 | 90 | 14 | 37 | 462 | 12 | 4 | 579 | 22 |
| Future Volume (vph) | 18 | 61 | 39 | 8 | 90 | 14 | 37 | 462 | 12 | 4 | 579 | 22 |
| 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 |
| Fr _t | | 0.955 | | | 0.983 | | | 0.997 | | | 0.995 | |
| Fl _t Protected | | 0.992 | | | 0.996 | | | 0.996 | | | | |
| Satd. Flow (prot) | 0 | 1765 | 0 | 0 | 1824 | 0 | 0 | 1868 | 0 | 0 | 1872 | 0 |
| Fl _t Permitted | | 0.885 | | | 0.972 | | | 0.924 | | | 0.997 | |
| Satd. Flow (perm) | 0 | 1574 | 0 | 0 | 1780 | 0 | 0 | 1733 | 0 | 0 | 1866 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 25 | | | 7 | | | 3 | | | 4 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 317 | | | 357 | | | 343 | | | 284 | |
| Travel Time (s) | | 7.2 | | | 8.1 | | | 7.8 | | | 6.5 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.68 | 0.68 | 0.68 | 0.84 | 0.84 | 0.84 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| Adj. Flow (vph) | 23 | 76 | 49 | 12 | 132 | 21 | 44 | 550 | 14 | 4 | 643 | 24 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 148 | 0 | 0 | 165 | 0 | 0 | 608 | 0 | 0 | 671 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 8: E. Foster St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 65.0 | 65.0 | | 65.0 | 65.0 | |
| Total Split (%) | 27.0% | 27.0% | | 27.0% | 27.0% | | 73.0% | 73.0% | | 73.0% | 73.0% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 59.0 | 59.0 | | 59.0 | 59.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 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 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 13.1 | | | 13.1 | | | 63.9 | | | 63.9 | |
| Actuated g/C Ratio | | 0.15 | | | 0.15 | | | 0.72 | | | 0.72 | |
| v/c Ratio | | 0.58 | | | 0.62 | | | 0.49 | | | 0.50 | |
| Control Delay (s/veh) | | 38.0 | | | 43.5 | | | 7.7 | | | 7.7 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 38.0 | | | 43.5 | | | 7.7 | | | 7.7 | |
| LOS | | D | | | D | | | A | | | A | |
| Approach Delay (s/veh) | | 38.0 | | | 43.5 | | | 7.7 | | | 7.7 | |
| Approach LOS | | D | | | D | | | A | | | A | |
| 90th %ile Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 59.0 | 59.0 | | 59.0 | 59.0 | |
| 90th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 15.3 | 15.3 | | 15.3 | 15.3 | | 61.7 | 61.7 | | 61.7 | 61.7 | |
| 70th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 13.2 | 13.2 | | 13.2 | 13.2 | | 63.8 | 63.8 | | 63.8 | 63.8 | |
| 50th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 11.1 | 11.1 | | 11.1 | 11.1 | | 65.9 | 65.9 | | 65.9 | 65.9 | |
| 30th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 69.0 | 69.0 | | 69.0 | 69.0 | |
| 10th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 89 | | | 97 | | | 214 | | | 255 | |
| Fuel Used(gal) | | 2 | | | 2 | | | 3 | | | 4 | |
| CO Emissions (g/hr) | | 119 | | | 129 | | | 234 | | | 258 | |
| NOx Emissions (g/hr) | | 23 | | | 25 | | | 46 | | | 50 | |
| VOC Emissions (g/hr) | | 27 | | | 30 | | | 54 | | | 60 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 65 | | | 84 | | | 124 | | | 139 | |
| Queue Length 95th (ft) | | 101 | | | 100 | | | 208 | | | 258 | |
| Internal Link Dist (ft) | | 237 | | | 277 | | | 263 | | | 204 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 338 | | | 365 | | | 1244 | | | 1340 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM

8: E. Foster St. & Lebanon St.

01/23/2024

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 0.44 | | | 0.45 | | | 0.49 | | | 0.50 | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 89 |
| Actuated Cycle Length: | 89 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 60 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.62 |
| Intersection Signal Delay (s/veh): | 14.2 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 72.1% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

Splits and Phases: 8: E. Foster St. & Lebanon St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 11: Lebanon St. & Upham St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↕ | | ↖ | ↗ | | | ↕ | | | ↕ | |
| Traffic Volume (vph) | 15 | 132 | 17 | 311 | 279 | 73 | 28 | 325 | 142 | 54 | 260 | 12 |
| Future Volume (vph) | 15 | 132 | 17 | 311 | 279 | 73 | 28 | 325 | 142 | 54 | 260 | 12 |
| 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 | | 0.986 | | | 0.969 | | | 0.961 | | | 0.995 | |
| Flt Protected | | 0.995 | | 0.950 | | | | 0.997 | | | 0.992 | |
| Satd. Flow (prot) | 0 | 1827 | 0 | 1787 | 1823 | 0 | 0 | 1802 | 0 | 0 | 1839 | 0 |
| Flt Permitted | | 0.907 | | 0.630 | | | | 0.966 | | | 0.853 | |
| Satd. Flow (perm) | 0 | 1666 | 0 | 1185 | 1823 | 0 | 0 | 1746 | 0 | 0 | 1581 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 8 | | | 18 | | | 40 | | | 4 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 408 | | | 396 | | | 341 | | | 673 | |
| Travel Time (s) | | 9.3 | | | 9.0 | | | 7.8 | | | 15.3 | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.82 | 0.82 | 0.82 | 0.89 | 0.89 | 0.89 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% |
| Adj. Flow (vph) | 18 | 155 | 20 | 379 | 340 | 89 | 31 | 365 | 160 | 61 | 295 | 14 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 193 | 0 | 379 | 429 | 0 | 0 | 556 | 0 | 0 | 370 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 11: Lebanon St. & Upham St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 39.0 | 39.0 | | 26.0 | 26.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 40.0% | 40.0% | | 40.0% | 40.0% | | 60.0% | 60.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | 6.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 24.0 | | 24.0 | 24.0 | | | 39.0 | | | 39.0 | |
| Actuated g/C Ratio | | 0.32 | | 0.32 | 0.32 | | | 0.52 | | | 0.52 | |
| v/c Ratio | | 0.36 | | 1.00 | 0.72 | | | 0.60 | | | 0.45 | |
| Control Delay (s/veh) | | 21.1 | | 75.3 | 29.8 | | | 14.9 | | | 13.3 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 21.1 | | 75.3 | 29.8 | | | 14.9 | | | 13.3 | |
| LOS | | C | | E | C | | | B | | | B | |
| Approach Delay (s/veh) | | 21.1 | | | 51.2 | | | 14.9 | | | 13.3 | |
| Approach LOS | | C | | | D | | | B | | | B | |
| 90th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 90th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 70th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 50th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 30th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 10th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 117 | | 255 | 290 | | | 310 | | | 193 | |
| Fuel Used(gal) | | 2 | | 7 | 5 | | | 5 | | | 4 | |
| CO Emissions (g/hr) | | 131 | | 499 | 337 | | | 317 | | | 256 | |
| NOx Emissions (g/hr) | | 25 | | 97 | 66 | | | 62 | | | 50 | |
| VOC Emissions (g/hr) | | 30 | | 116 | 78 | | | 73 | | | 59 | |
| Dilemma Vehicles (#) | | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 65 | | 174 | 167 | | | 155 | | | 99 | |
| Queue Length 95th (ft) | | 110 | | #299 | 234 | | | 247 | | | 159 | |
| Internal Link Dist (ft) | | 328 | | | 316 | | | 261 | | | 593 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 538 | | 379 | 595 | | | 927 | | | 824 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | | | 0 | | | 0 | |

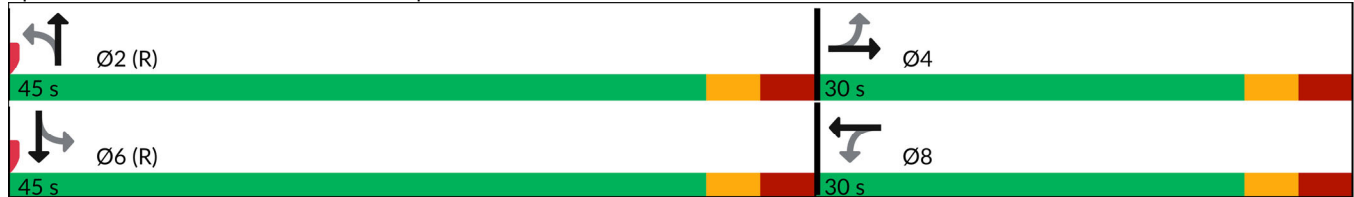


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|------|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 0.36 | | 1.00 | 0.72 | | | 0.60 | | | 0.45 | |

Intersection Summary

| | |
|---|---|
| Area Type: | Other |
| Cycle Length: | 75 |
| Actuated Cycle Length: | 75 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.00 |
| Intersection Signal Delay (s/veh): | 30.4 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 84.2% |
| 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: 11: Lebanon St. & Upham St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 14: Lebanon St. & E. Emerson St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Volume (vph) | 18 | 54 | 44 | 16 | 173 | 42 | 46 | 361 | 7 | 3 | 267 | 20 |
| Future Volume (vph) | 18 | 54 | 44 | 16 | 173 | 42 | 46 | 361 | 7 | 3 | 267 | 20 |
| 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 | | 0.949 | | | 0.976 | | | 0.998 | | | 0.991 | |
| Flt Protected | | 0.992 | | | 0.997 | | | 0.994 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1720 | 0 | 0 | 1813 | 0 | 0 | 1866 | 0 | 0 | 1844 | 0 |
| Flt Permitted | | 0.904 | | | 0.971 | | | 0.924 | | | 0.996 | |
| Satd. Flow (perm) | 0 | 1567 | 0 | 0 | 1765 | 0 | 0 | 1735 | 0 | 0 | 1839 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 43 | | | 16 | | | 1 | | | 6 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 272 | | | 331 | | | 673 | | | 588 | |
| Travel Time (s) | | 6.2 | | | 7.5 | | | 15.3 | | | 13.4 | |
| Peak Hour Factor | 0.72 | 0.72 | 0.72 | 0.76 | 0.76 | 0.76 | 0.80 | 0.80 | 0.80 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Adj. Flow (vph) | 25 | 75 | 61 | 21 | 228 | 55 | 58 | 451 | 9 | 4 | 322 | 24 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 161 | 0 | 0 | 304 | 0 | 0 | 518 | 0 | 0 | 350 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 14: Lebanon St. & E. Emerson St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 47.1% | 47.1% | | 47.1% | 47.1% | | 52.9% | 52.9% | | 52.9% | 52.9% | |
| Maximum Green (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.7 | | | 21.7 | | | 51.3 | | | 51.3 | |
| Actuated g/C Ratio | | 0.26 | | | 0.26 | | | 0.60 | | | 0.60 | |
| v/c Ratio | | 0.37 | | | 0.66 | | | 0.50 | | | 0.32 | |
| Control Delay (s/veh) | | 20.9 | | | 33.8 | | | 12.1 | | | 9.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 20.9 | | | 33.8 | | | 12.1 | | | 9.5 | |
| LOS | | C | | | C | | | B | | | A | |
| Approach Delay (s/veh) | | 20.9 | | | 33.8 | | | 12.1 | | | 9.5 | |
| Approach LOS | | C | | | C | | | B | | | A | |
| 90th %ile Green (s) | 26.6 | 26.6 | | 26.6 | 26.6 | | 46.4 | 46.4 | | 46.4 | 46.4 | |
| 90th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 22.1 | 22.1 | | 22.1 | 22.1 | | 50.9 | 50.9 | | 50.9 | 50.9 | |
| 70th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 50th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 30th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 10th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 68 | | | 191 | | | 228 | | | 135 | |
| Fuel Used(gal) | | 1 | | | 3 | | | 4 | | | 3 | |
| CO Emissions (g/hr) | | 78 | | | 227 | | | 311 | | | 214 | |
| NOx Emissions (g/hr) | | 15 | | | 44 | | | 61 | | | 42 | |
| VOC Emissions (g/hr) | | 18 | | | 53 | | | 72 | | | 50 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 52 | | | 142 | | | 133 | | | 76 | |
| Queue Length 95th (ft) | | 70 | | | 164 | | | 213 | | | 136 | |
| Internal Link Dist (ft) | | 192 | | | 251 | | | 593 | | | 508 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 652 | | | 715 | | | 1046 | | | 1111 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM

14: Lebanon St. & E. Emerson St.

01/23/2024

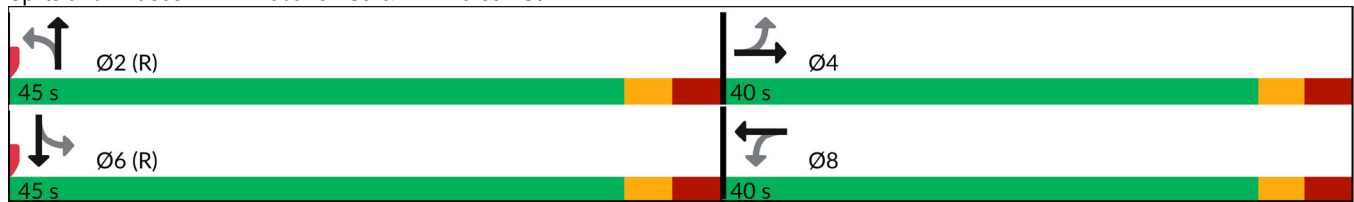


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 0.25 | | | 0.43 | | | 0.50 | | | 0.32 | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 85 |
| Actuated Cycle Length: | 85 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 55 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.66 |
| Intersection Signal Delay (s/veh): | 17.5 |
| Intersection LOS: | B |
| Intersection Capacity Utilization: | 69.1% |
| ICU Level of Service: | C |
| Analysis Period (min): | 15 |

Splits and Phases: 14: Lebanon St. & E. Emerson St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 17: Main St/Main St. & Lebanon St. & Porter St.

01/23/2024

| Lane Group | WBL | WBR | NBT | NBR | NBR2 | SBL2 | SBL | SBT | NWL | NWR | NWR2 | |
|----------------------------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|--|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 281 | 12 | 5 | 36 | 307 | 497 | 0 | 373 | 12 | |
| Future Volume (vph) | 0 | 0 | 281 | 12 | 5 | 36 | 307 | 497 | 0 | 373 | 12 | |
| Ideal Flow (vphpl) | 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 | |
| Fr _t | | | 0.992 | | | | | | | | 0.865 | |
| Fl _t Protected | | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 0 | 1848 | 0 | 0 | 0 | 1770 | 1863 | 0 | 1611 | 0 | |
| Fl _t Permitted | | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 0 | 0 | 1848 | 0 | 0 | 0 | 1770 | 1863 | 0 | 1611 | 0 | |
| Right Turn on Red | | Yes | | | Yes | | | | | | Yes | |
| Satd. Flow (RTOR) | | | 1 | | | | | | | 65 | | |
| Link Speed (mph) | 30 | | 30 | | | | | 30 | 30 | | | |
| Link Distance (ft) | 409 | | 491 | | | | | 318 | 187 | | | |
| Travel Time (s) | 9.3 | | 11.2 | | | | | 7.2 | 4.3 | | | |
| 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 | |
| Adj. Flow (vph) | 0 | 0 | 305 | 13 | 5 | 39 | 334 | 540 | 0 | 405 | 13 | |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 323 | 0 | 0 | 0 | 373 | 540 | 0 | 418 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Right | Right | Left | Left | Left | Left | Right | Right | |
| Median Width(ft) | 0 | | 12 | | | | | 18 | 0 | | | |
| Link Offset(ft) | 0 | | 0 | | | | | 0 | 0 | | | |
| Crosswalk Width(ft) | 16 | | 16 | | | | | 16 | 16 | | | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | 15 | 9 | | 9 | 9 | 15 | 60 | | 15 | 60 | 9 | |
| Number of Detectors | | | 2 | | | 1 | 1 | 2 | | 1 | | |
| Detector Template | | | Thru | | | Left | Left | Thru | | Right | | |
| Leading Detector (ft) | | | 100 | | | 20 | 20 | 100 | | 20 | | |
| Trailing Detector (ft) | | | 0 | | | 0 | 0 | 0 | | 0 | | |
| Detector 1 Position(ft) | | | 0 | | | 0 | 0 | 0 | | 0 | | |
| Detector 1 Size(ft) | | | 6 | | | 20 | 20 | 6 | | 20 | | |
| Detector 1 Type | | | Cl+Ex | | | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | | 0.0 | | | 0.0 | 0.0 | 0.0 | | 0.0 | | |
| Detector 1 Queue (s) | | | 0.0 | | | 0.0 | 0.0 | 0.0 | | 0.0 | | |
| Detector 1 Delay (s) | | | 0.0 | | | 0.0 | 0.0 | 0.0 | | 0.0 | | |
| Detector 2 Position(ft) | | | 94 | | | | | 94 | | | | |
| Detector 2 Size(ft) | | | 6 | | | | | 6 | | | | |
| Detector 2 Type | | | Cl+Ex | | | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | | | 0.0 | | | | |
| Turn Type | | | NA | | | Prot | Prot | NA | | Prot | | |
| Protected Phases | | | 2 | | | 1 | 1 | 6 | | 4 | | |
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | | | 2 | | | 1 | 1 | 6 | | 4 | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | 15.0 | | | 10.0 | 10.0 | 8.0 | | 15.0 | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 17: Main St/Main St. & Lebanon St. & Porter St.

01/23/2024

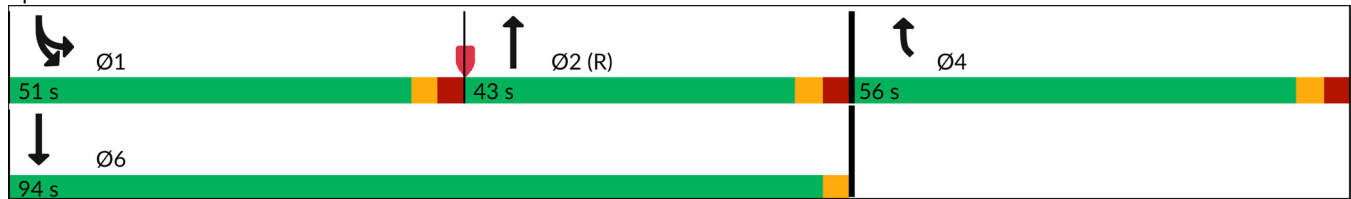


| Lane Group | WBL | WBR | NBT | NBR | NBR2 | SBL2 | SBL | SBT | NWL | NWR | NWR2 |
|-------------------------|-----|-----|-------|-----|------|-------|-------|-------|------|-------|------|
| Minimum Split (s) | | | 29.0 | | | 29.0 | 29.0 | 26.0 | | 29.0 | |
| Total Split (s) | | | 43.0 | | | 51.0 | 51.0 | 94.0 | | 56.0 | |
| Total Split (%) | | | 28.7% | | | 34.0% | 34.0% | 62.7% | | 37.3% | |
| Maximum Green (s) | | | 37.0 | | | 45.0 | 45.0 | 91.0 | | 50.0 | |
| Yellow Time (s) | | | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | |
| All-Red Time (s) | | | 3.0 | | | 3.0 | 3.0 | 0.0 | | 3.0 | |
| Lost Time Adjust (s) | | | 0.0 | | | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | | 6.0 | | | | 6.0 | 3.0 | | 6.0 | |
| Lead/Lag | | | Lag | | | Lead | Lead | | | | |
| Lead-Lag Optimize? | | | Yes | | | Yes | Yes | | | | |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | | | C-Max | | | None | None | None | | None | |
| Walk Time (s) | | | 12.0 | | | 12.0 | 12.0 | 12.0 | | 12.0 | |
| 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) | | | 56.0 | | | | 36.6 | 101.6 | | 39.4 | |
| Actuated g/C Ratio | | | 0.37 | | | | 0.24 | 0.68 | | 0.26 | |
| v/c Ratio | | | 0.47 | | | | 0.87 | 0.43 | | 0.89 | |
| Control Delay (s/veh) | | | 42.2 | | | | 73.9 | 13.5 | | 65.1 | |
| Queue Delay | | | 0.0 | | | | 56.1 | 9.8 | | 0.0 | |
| Total Delay (s/veh) | | | 42.2 | | | | 130.0 | 23.3 | | 65.1 | |
| LOS | | | D | | | | F | C | | E | |
| Approach Delay (s/veh) | | | 42.2 | | | | | 66.9 | 65.1 | | |
| Approach LOS | | | D | | | | | E | E | | |
| 90th %ile Green (s) | | | 37.0 | | | 45.0 | 45.0 | 91.0 | | 50.0 | |
| 90th %ile Term Code | | | Coord | | | Max | Max | Coord | | Max | |
| 70th %ile Green (s) | | | 46.2 | | | 41.0 | 41.0 | 96.2 | | 44.8 | |
| 70th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| 50th %ile Green (s) | | | 55.0 | | | 37.0 | 37.0 | 101.0 | | 40.0 | |
| 50th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| 30th %ile Green (s) | | | 64.2 | | | 32.9 | 32.9 | 106.1 | | 34.9 | |
| 30th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| 10th %ile Green (s) | | | 77.6 | | | 26.9 | 26.9 | 113.5 | | 27.5 | |
| 10th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| Stops (vph) | | | 232 | | | | 322 | 225 | | 317 | |
| Fuel Used(gal) | | | 5 | | | | 8 | 4 | | 9 | |
| CO Emissions (g/hr) | | | 348 | | | | 544 | 269 | | 642 | |
| NOx Emissions (g/hr) | | | 68 | | | | 106 | 52 | | 125 | |
| VOC Emissions (g/hr) | | | 81 | | | | 126 | 62 | | 149 | |
| Dilemma Vehicles (#) | | | 0 | | | | 0 | 0 | | 0 | |
| Queue Length 50th (ft) | | | 241 | | | | 351 | 228 | | 341 | |
| Queue Length 95th (ft) | | | 404 | | | | 448 | 371 | | 441 | |
| Internal Link Dist (ft) | 329 | | 411 | | | | | 238 | 107 | | |
| Turn Bay Length (ft) | | | | | | | | | | | |
| Base Capacity (vph) | | | 690 | | | | 531 | 1261 | | 580 | |
| Starvation Cap Reductn | | | 0 | | | | 192 | 684 | | 0 | |
| Spillback Cap Reductn | | | 0 | | | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | | 0 | | | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | | 0.47 | | | | 1.10 | 0.94 | | 0.72 | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:NBT, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.89 |
| Intersection Signal Delay (s/veh): | 61.6 |
| Intersection LOS: | E |
| Intersection Capacity Utilization | 73.7% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

Splits and Phases: 17: Main St/Main St. & Lebanon St. & Porter St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 20: Main St. & Green St.

01/23/2024



| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR | SWR2 |
|----------------------------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | ↕ | | | ↑ | | ↙ | | |
| Traffic Volume (vph) | 0 | 0 | 24 | 480 | 140 | 0 | 660 | 0 | 198 | 0 | 18 |
| Future Volume (vph) | 0 | 0 | 24 | 480 | 140 | 0 | 660 | 0 | 198 | 0 | 18 |
| Ideal Flow (vphpl) | 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 |
| Fr _t | | | | 0.970 | | | | | 0.989 | | |
| Fl _t Protected | | | | 0.998 | | | | | 0.956 | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 1803 | 0 | 0 | 1845 | 0 | 1727 | 0 | 0 |
| Fl _t Permitted | | | | 0.963 | | | | | 0.956 | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 1740 | 0 | 0 | 1845 | 0 | 1727 | 0 | 0 |
| Right Turn on Red | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | 28 | | | | | 29 | | |
| Link Speed (mph) | 30 | | | 30 | | | 30 | | 30 | | |
| Link Distance (ft) | 512 | | | 318 | | | 518 | | 148 | | |
| Travel Time (s) | 11.6 | | | 7.2 | | | 11.8 | | 3.4 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.82 | 0.82 | 0.86 | 0.86 | 0.92 | 0.85 | 0.92 | 0.85 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 3% | 3% | 2% | 4% | 2% | 4% |
| Adj. Flow (vph) | 0 | 0 | 26 | 585 | 171 | 0 | 767 | 0 | 233 | 0 | 21 |
| Shared Lane Traffic (%) | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 782 | 0 | 0 | 767 | 0 | 254 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Right | Left | Left | Right | Left | Right | Right |
| Median Width(ft) | 0 | | | 0 | | | 0 | | 12 | | |
| Link Offset(ft) | 0 | | | 0 | | | 12 | | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | | | 16 | | 16 | | |
| Two way Left Turn Lane | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 60 | 60 | 60 | | 9 | 15 | | 60 | 15 | 60 | 9 |
| Number of Detectors | | | 1 | 2 | | | 2 | | 1 | | |
| Detector Template | | | Left | Thru | | | Thru | | Left | | |
| Leading Detector (ft) | | | 20 | 100 | | | 100 | | 20 | | |
| Trailing Detector (ft) | | | 0 | 0 | | | 0 | | 0 | | |
| Detector 1 Position(ft) | | | 0 | 0 | | | 0 | | 0 | | |
| Detector 1 Size(ft) | | | 20 | 6 | | | 6 | | 20 | | |
| Detector 1 Type | | | Cl+Ex | Cl+Ex | | | Cl+Ex | | Cl+Ex | | |
| Detector 1 Channel | | | | | | | | | | | |
| Detector 1 Extend (s) | | | 0.0 | 0.0 | | | 0.0 | | 0.0 | | |
| Detector 1 Queue (s) | | | 0.0 | 0.0 | | | 0.0 | | 0.0 | | |
| Detector 1 Delay (s) | | | 0.0 | 0.0 | | | 0.0 | | 0.0 | | |
| Detector 2 Position(ft) | | | | 94 | | | 94 | | | | |
| Detector 2 Size(ft) | | | | 6 | | | 6 | | | | |
| Detector 2 Type | | | | Cl+Ex | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | | | 0.0 | | | | |
| Turn Type | | | Perm | NA | | | NA | | Prot | | |
| Protected Phases | | | | 2 | | | 6 | | 8 | | |
| Permitted Phases | | | 2 | | | | | | | | |
| Detector Phase | | | 2 | 2 | | | 6 | | 8 | | |
| Switch Phase | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 20: Main St. & Green St.

01/23/2024



| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR | SWR2 |
|-------------------------|-----|-----|-------|-------|-----|-----|-------|-----|-------|-----|------|
| Minimum Initial (s) | | | 66.0 | 66.0 | | | 63.0 | | 10.0 | | |
| Minimum Split (s) | | | 72.0 | 72.0 | | | 69.0 | | 24.0 | | |
| Total Split (s) | | | 83.0 | 83.0 | | | 83.0 | | 30.0 | | |
| Total Split (%) | | | 73.5% | 73.5% | | | 73.5% | | 26.5% | | |
| Maximum Green (s) | | | 77.0 | 77.0 | | | 77.0 | | 24.0 | | |
| Yellow Time (s) | | | 3.0 | 3.0 | | | 3.0 | | 3.0 | | |
| All-Red Time (s) | | | 3.0 | 3.0 | | | 3.0 | | 3.0 | | |
| Lost Time Adjust (s) | | | | 0.0 | | | 0.0 | | 0.0 | | |
| Total Lost Time (s) | | | | 6.0 | | | 6.0 | | 6.0 | | |
| Lead/Lag | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | |
| Vehicle Extension (s) | | | 3.0 | 3.0 | | | 3.0 | | 3.0 | | |
| Recall Mode | | | C-Max | C-Max | | | C-Max | | None | | |
| Walk Time (s) | | | 4.0 | 4.0 | | | 4.0 | | 4.0 | | |
| Flash Dont Walk (s) | | | 11.0 | 11.0 | | | 11.0 | | 11.0 | | |
| Pedestrian Calls (#/hr) | | | 0 | 0 | | | 0 | | 0 | | |
| Act Effct Green (s) | | | | 81.6 | | | 81.6 | | 19.4 | | |
| Actuated g/C Ratio | | | | 0.72 | | | 0.72 | | 0.17 | | |
| v/c Ratio | | | | 0.62 | | | 0.58 | | 0.79 | | |
| Control Delay (s/veh) | | | | 10.9 | | | 10.3 | | 57.3 | | |
| Queue Delay | | | | 16.9 | | | 0.0 | | 0.0 | | |
| Total Delay (s/veh) | | | | 27.9 | | | 10.3 | | 57.3 | | |
| LOS | | | | C | | | B | | E | | |
| Approach Delay (s/veh) | | | | 27.9 | | | 10.3 | | 57.3 | | |
| Approach LOS | | | | C | | | B | | E | | |
| 90th %ile Green (s) | | | 77.0 | 77.0 | | | 77.0 | | 24.0 | | |
| 90th %ile Term Code | | | Coord | Coord | | | Coord | | Max | | |
| 70th %ile Green (s) | | | 77.9 | 77.9 | | | 77.9 | | 23.1 | | |
| 70th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 50th %ile Green (s) | | | 80.9 | 80.9 | | | 80.9 | | 20.1 | | |
| 50th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 30th %ile Green (s) | | | 83.9 | 83.9 | | | 83.9 | | 17.1 | | |
| 30th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 10th %ile Green (s) | | | 88.4 | 88.4 | | | 88.4 | | 12.6 | | |
| 10th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| Stops (vph) | | | | 312 | | | 309 | | 182 | | |
| Fuel Used(gal) | | | | 5 | | | 6 | | 4 | | |
| CO Emissions (g/hr) | | | | 332 | | | 402 | | 311 | | |
| NOx Emissions (g/hr) | | | | 65 | | | 78 | | 61 | | |
| VOC Emissions (g/hr) | | | | 77 | | | 93 | | 72 | | |
| Dilemma Vehicles (#) | | | | 0 | | | 0 | | 0 | | |
| Queue Length 50th (ft) | | | | 247 | | | 238 | | 158 | | |
| Queue Length 95th (ft) | | | | 336 | | | 352 | | 224 | | |
| Internal Link Dist (ft) | 432 | | | 238 | | | 438 | | 68 | | |
| Turn Bay Length (ft) | | | | | | | | | | | |
| Base Capacity (vph) | | | | 1264 | | | 1332 | | 389 | | |
| Starvation Cap Reductn | | | | 482 | | | 0 | | 0 | | |
| Spillback Cap Reductn | | | | 0 | | | 0 | | 0 | | |
| Storage Cap Reductn | | | | 0 | | | 0 | | 0 | | |

TIP Before and After Evaluations - Melrose - Lebanon Street AM

20: Main St. & Green St.

01/23/2024

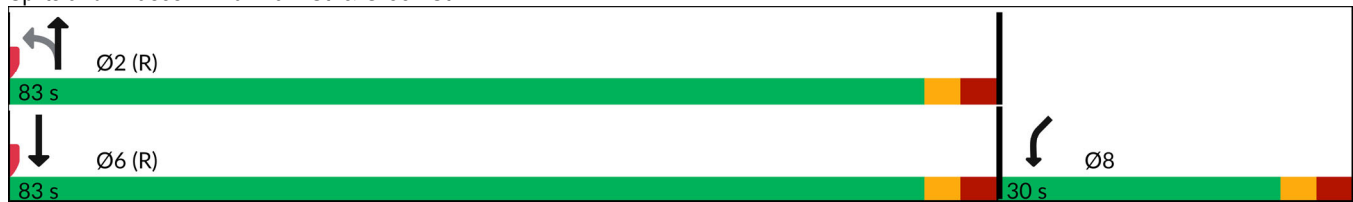


| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR | SWR2 |
|-------------------|-----|-----|-----|------|-----|-----|------|-----|------|-----|------|
| Reduced v/c Ratio | | | | 1.00 | | | 0.58 | | 0.65 | | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 113 |
| Actuated Cycle Length: | 113 |
| Offset: | 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green |
| Natural Cycle: | 100 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.79 |
| Intersection Signal Delay (s/veh): | 24.5 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 77.1% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

Splits and Phases: 20: Main St. & Green St.



TIP Before and After Evaluations - Melrose - Lebanon Street AM
 22: Lebanon St.

01/23/2024



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 34 | 6 | 496 | 15 | 4 | 592 |
| Future Volume (vph) | 34 | 6 | 496 | 15 | 4 | 592 |
| Ideal Flow (vphp) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.979 | | 0.996 | | | |
| Flt Protected | 0.960 | | | | | |
| Satd. Flow (prot) | 1751 | 0 | 1855 | 0 | 0 | 1863 |
| Flt Permitted | 0.960 | | | | | |
| Satd. Flow (perm) | 1751 | 0 | 1855 | 0 | 0 | 1863 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 231 | | 284 | | | 116 |
| Travel Time (s) | 4.6 | | 5.3 | | | 2.5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 37 | 7 | 539 | 16 | 4 | 643 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 44 | 0 | 555 | 0 | 0 | 647 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 60 | 60 | | 60 | 60 | |
| Sign Control | Stop | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 44.3% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

TIP Before and After Evaluations - Melrose - Lebanon Street AM
 24: Lebanon St.

01/23/2024



| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|----------------------------|-------|-------|------|------|------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 8 | 10 | 2 | 487 | 586 | 2 |
| Future Volume (vph) | 8 | 10 | 2 | 487 | 586 | 2 |
| Ideal Flow (vphp) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.926 | | | | | |
| Flt Protected | 0.978 | | | | | |
| Satd. Flow (prot) | 1687 | 0 | 0 | 1863 | 1863 | 0 |
| Flt Permitted | 0.978 | | | | | |
| Satd. Flow (perm) | 1687 | 0 | 0 | 1863 | 1863 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 251 | | | 116 | 341 | |
| Travel Time (s) | 4.3 | | | 2.5 | 8.5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 9 | 11 | 2 | 529 | 637 | 2 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 20 | 0 | 0 | 531 | 639 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 0 | 0 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 60 | 60 | 60 | | | 60 |
| Sign Control | Stop | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 41.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 3: Grove St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↔ | | | ↔ | | | ↔ | | | ↔ | |
| Traffic Volume (vph) | 76 | 108 | 41 | 23 | 69 | 17 | 49 | 498 | 21 | 18 | 470 | 47 |
| Future Volume (vph) | 76 | 108 | 41 | 23 | 69 | 17 | 49 | 498 | 21 | 18 | 470 | 47 |
| 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 |
| Fr _t | | 0.975 | | | 0.979 | | | 0.995 | | | 0.988 | |
| Fl _t Protected | | 0.983 | | | 0.990 | | | 0.996 | | | 0.998 | |
| Satd. Flow (prot) | 0 | 1718 | 0 | 0 | 1805 | 0 | 0 | 1864 | 0 | 0 | 1855 | 0 |
| Fl _t Permitted | | 0.816 | | | 0.824 | | | 0.911 | | | 0.970 | |
| Satd. Flow (perm) | 0 | 1426 | 0 | 0 | 1503 | 0 | 0 | 1705 | 0 | 0 | 1803 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 12 | | | 10 | | | 4 | | | 11 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 324 | | | 398 | | | 212 | | | 301 | |
| Travel Time (s) | | 7.4 | | | 9.0 | | | 4.8 | | | 6.8 | |
| Peak Hour Factor | 0.65 | 0.65 | 0.65 | 0.72 | 0.72 | 0.72 | 0.82 | 0.82 | 0.82 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| Adj. Flow (vph) | 117 | 166 | 63 | 32 | 96 | 24 | 60 | 607 | 26 | 20 | 516 | 52 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 346 | 0 | 0 | 152 | 0 | 0 | 693 | 0 | 0 | 588 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 3: Grove St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 37.0 | 37.0 | | 37.0 | 37.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 43.0 | 43.0 | | 43.0 | 43.0 | |
| Total Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 62.0 | 62.0 | | 62.0 | 62.0 | |
| Total Split (%) | 29.5% | 29.5% | | 29.5% | 29.5% | | 70.5% | 70.5% | | 70.5% | 70.5% | |
| Maximum Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 20.0 | | | 20.0 | | | 56.0 | | | 56.0 | |
| Actuated g/C Ratio | | 0.23 | | | 0.23 | | | 0.64 | | | 0.64 | |
| v/c Ratio | | 1.04 | | | 0.44 | | | 0.64 | | | 0.51 | |
| Control Delay (s/veh) | | 94.4 | | | 31.8 | | | 13.1 | | | 10.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 94.4 | | | 31.8 | | | 13.1 | | | 10.4 | |
| LOS | | F | | | C | | | B | | | B | |
| Approach Delay (s/veh) | | 94.4 | | | 31.8 | | | 13.1 | | | 10.4 | |
| Approach LOS | | F | | | C | | | B | | | B | |
| 90th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 90th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 70th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 50th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 30th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 56.0 | 56.0 | | 56.0 | 56.0 | |
| 10th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 181 | | | 85 | | | 332 | | | 268 | |
| Fuel Used(gal) | | 6 | | | 2 | | | 4 | | | 4 | |
| CO Emissions (g/hr) | | 412 | | | 106 | | | 300 | | | 270 | |
| NOx Emissions (g/hr) | | 80 | | | 21 | | | 58 | | | 53 | |
| VOC Emissions (g/hr) | | 95 | | | 25 | | | 70 | | | 63 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | ~204 | | | 68 | | | 210 | | | 154 | |
| Queue Length 95th (ft) | | #211 | | | 96 | | | 268 | | | 233 | |
| Internal Link Dist (ft) | | 244 | | | 318 | | | 132 | | | 221 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 333 | | | 349 | | | 1086 | | | 1151 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM

3: Grove St. & Lebanon St.

01/23/2024

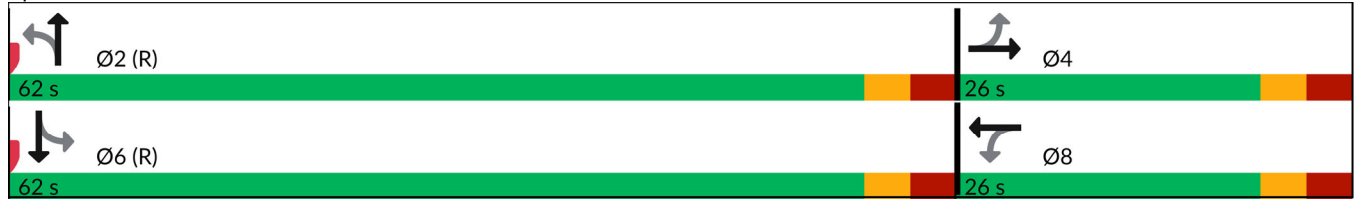


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 1.04 | | | 0.44 | | | 0.64 | | | 0.51 | |

Intersection Summary

| | |
|---|---|
| Area Type: | Other |
| Cycle Length: | 88 |
| Actuated Cycle Length: | 88 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.04 |
| Intersection Signal Delay (s/veh): | 29.6 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 77.8% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |
| ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. | |
| # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | |

Splits and Phases: 3: Grove St. & Lebanon St.



TIP Before and After Evaluations - Melrose - Lebanon Street PM
 6: Lebanon St. & Laurel St.

01/23/2024



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 18 | 5 | 572 | 19 | 4 | 513 |
| Future Volume (vph) | 18 | 5 | 572 | 19 | 4 | 513 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.973 | | 0.996 | | | |
| Flt Protected | 0.962 | | | | | |
| Satd. Flow (prot) | 1744 | 0 | 1855 | 0 | 0 | 1863 |
| Flt Permitted | 0.962 | | | | | |
| Satd. Flow (perm) | 1744 | 0 | 1855 | 0 | 0 | 1863 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 305 | | 301 | | | 343 |
| Travel Time (s) | 5.9 | | 6.0 | | | 8.2 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 20 | 5 | 622 | 21 | 4 | 558 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 25 | 0 | 643 | 0 | 0 | 562 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Stop | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 41.3% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 8: E. Foster St. & Lebanon St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Volume (vph) | 43 | 77 | 42 | 5 | 18 | 6 | 30 | 537 | 10 | 10 | 470 | 15 |
| Future Volume (vph) | 43 | 77 | 42 | 5 | 18 | 6 | 30 | 537 | 10 | 10 | 470 | 15 |
| 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 |
| Fr _t | | 0.965 | | | 0.971 | | | 0.998 | | | 0.996 | |
| Fl _t Protected | | 0.987 | | | 0.992 | | | 0.997 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1774 | 0 | 0 | 1794 | 0 | 0 | 1872 | 0 | 0 | 1872 | 0 |
| Fl _t Permitted | | 0.896 | | | 0.941 | | | 0.955 | | | 0.986 | |
| Satd. Flow (perm) | 0 | 1611 | 0 | 0 | 1702 | 0 | 0 | 1793 | 0 | 0 | 1847 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 18 | | | 9 | | | 2 | | | 4 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 317 | | | 357 | | | 343 | | | 284 | |
| Travel Time (s) | | 7.2 | | | 8.1 | | | 7.8 | | | 6.5 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.68 | 0.68 | 0.68 | 0.84 | 0.84 | 0.84 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% |
| Adj. Flow (vph) | 54 | 96 | 53 | 7 | 26 | 9 | 36 | 639 | 12 | 11 | 522 | 17 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 203 | 0 | 0 | 42 | 0 | 0 | 687 | 0 | 0 | 550 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM

8: E. Foster St. & Lebanon St.

01/23/2024














| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 18.0 | 18.0 | | 18.0 | 18.0 | |
| Minimum Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 65.0 | 65.0 | | 65.0 | 65.0 | |
| Total Split (%) | 27.0% | 27.0% | | 27.0% | 27.0% | | 73.0% | 73.0% | | 73.0% | 73.0% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 59.0 | 59.0 | | 59.0 | 59.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 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 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 14.7 | | | 14.7 | | | 62.3 | | | 62.3 | |
| Actuated g/C Ratio | | 0.17 | | | 0.17 | | | 0.70 | | | 0.70 | |
| v/c Ratio | | 0.72 | | | 0.15 | | | 0.55 | | | 0.43 | |
| Control Delay (s/veh) | | 46.5 | | | 26.2 | | | 9.1 | | | 7.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.4 | | | 0.0 | |
| Total Delay (s/veh) | | 46.5 | | | 26.2 | | | 9.5 | | | 7.4 | |
| LOS | | D | | | C | | | A | | | A | |
| Approach Delay (s/veh) | | 46.5 | | | 26.2 | | | 9.5 | | | 7.4 | |
| Approach LOS | | D | | | C | | | A | | | A | |
| 90th %ile Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 59.0 | 59.0 | | 59.0 | 59.0 | |
| 90th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 59.0 | 59.0 | | 59.0 | 59.0 | |
| 70th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 15.5 | 15.5 | | 15.5 | 15.5 | | 61.5 | 61.5 | | 61.5 | 61.5 | |
| 50th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 12.9 | 12.9 | | 12.9 | 12.9 | | 64.1 | 64.1 | | 64.1 | 64.1 | |
| 30th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 9.2 | 9.2 | | 9.2 | 9.2 | | 67.8 | 67.8 | | 67.8 | 67.8 | |
| 10th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 137 | | | 21 | | | 273 | | | 202 | |
| Fuel Used(gal) | | 3 | | | 0 | | | 4 | | | 3 | |
| CO Emissions (g/hr) | | 188 | | | 25 | | | 288 | | | 207 | |
| NOx Emissions (g/hr) | | 37 | | | 5 | | | 56 | | | 40 | |
| VOC Emissions (g/hr) | | 44 | | | 6 | | | 67 | | | 48 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 99 | | | 16 | | | 166 | | | 116 | |
| Queue Length 95th (ft) | | 144 | | | 31 | | | 244 | | | 193 | |
| Internal Link Dist (ft) | | 237 | | | 277 | | | 263 | | | 204 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 340 | | | 351 | | | 1255 | | | 1293 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 192 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM

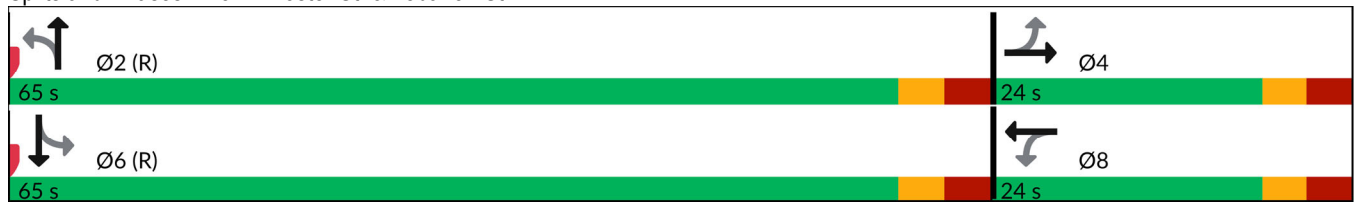
8: E. Foster St. & Lebanon St.

01/23/2024

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Reduced v/c Ratio | | 0.60 | | | 0.12 | | | 0.65 | | | 0.43 | |

| Intersection Summary | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 89 |
| Actuated Cycle Length: | 89 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 60 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.72 |
| Intersection Signal Delay (s/veh): | 14.3 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 68.8% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

Splits and Phases: 8: E. Foster St. & Lebanon St.



TIP Before and After Evaluations - Melrose - Lebanon Street PM

11: Lebanon St. & Upham St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 5 | 168 | 18 | 181 | 174 | 36 | 29 | 294 | 230 | 107 | 278 | 13 |
| Future Volume (vph) | 5 | 168 | 18 | 181 | 174 | 36 | 29 | 294 | 230 | 107 | 278 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.987 | | | 0.974 | | | 0.944 | | | 0.996 | |
| Flt Protected | | 0.999 | | 0.950 | | | | 0.997 | | | 0.987 | |
| Satd. Flow (prot) | 0 | 1837 | 0 | 1787 | 1832 | 0 | 0 | 1771 | 0 | 0 | 1831 | 0 |
| Flt Permitted | | 0.990 | | 0.566 | | | | 0.962 | | | 0.714 | |
| Satd. Flow (perm) | 0 | 1820 | 0 | 1065 | 1832 | 0 | 0 | 1708 | 0 | 0 | 1325 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 7 | | | 15 | | | 71 | | | 3 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 408 | | | 396 | | | 341 | | | 673 | |
| Travel Time (s) | | 9.3 | | | 9.0 | | | 7.8 | | | 15.3 | |
| Peak Hour Factor | 0.85 | 0.85 | 0.85 | 0.82 | 0.82 | 0.82 | 0.89 | 0.89 | 0.89 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 2% | 2% | 2% |
| Adj. Flow (vph) | 6 | 198 | 21 | 221 | 212 | 44 | 33 | 330 | 258 | 122 | 316 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 225 | 0 | 221 | 256 | 0 | 0 | 621 | 0 | 0 | 453 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 11: Lebanon St. & Upham St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 39.0 | 39.0 | | 26.0 | 26.0 | |
| Total Split (s) | 30.0 | 30.0 | | 30.0 | 30.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 40.0% | 40.0% | | 40.0% | 40.0% | | 60.0% | 60.0% | | 60.0% | 60.0% | |
| Maximum Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | 6.0 | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 9.0 | 9.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | | 9.0 | 9.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 21.8 | | 21.8 | 21.8 | | | 41.2 | | | 41.2 | |
| Actuated g/C Ratio | | 0.29 | | 0.29 | 0.29 | | | 0.55 | | | 0.55 | |
| v/c Ratio | | 0.42 | | 0.72 | 0.47 | | | 0.64 | | | 0.62 | |
| Control Delay (s/veh) | | 23.2 | | 37.9 | 23.4 | | | 14.5 | | | 16.7 | |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 23.2 | | 37.9 | 23.4 | | | 14.5 | | | 16.7 | |
| LOS | | C | | D | C | | | B | | | B | |
| Approach Delay (s/veh) | | 23.2 | | | 30.1 | | | 14.5 | | | 16.7 | |
| Approach LOS | | C | | | C | | | B | | | B | |
| 90th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 90th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| 70th %ile Term Code | Hold | Hold | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 21.0 | 21.0 | | 21.0 | 21.0 | | 42.0 | 42.0 | | 42.0 | 42.0 | |
| 50th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 43.0 | 43.0 | | 43.0 | 43.0 | |
| 30th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 43.0 | 43.0 | | 43.0 | 43.0 | |
| 10th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 143 | | 158 | 156 | | | 340 | | | 270 | |
| Fuel Used(gal) | | 2 | | 3 | 3 | | | 5 | | | 5 | |
| CO Emissions (g/hr) | | 161 | | 198 | 176 | | | 348 | | | 346 | |
| NOx Emissions (g/hr) | | 31 | | 38 | 34 | | | 68 | | | 67 | |
| VOC Emissions (g/hr) | | 37 | | 46 | 41 | | | 81 | | | 80 | |
| Dilemma Vehicles (#) | | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 83 | | 93 | 93 | | | 157 | | | 128 | |
| Queue Length 95th (ft) | | 126 | | 143 | 133 | | | 284 | | | 236 | |
| Internal Link Dist (ft) | | 328 | | | 316 | | | 261 | | | 593 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 587 | | 340 | 596 | | | 970 | | | 729 | |
| Starvation Cap Reductn | | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | 0 | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | 0 | 0 | | | 0 | | | 0 | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM

11: Lebanon St. & Upham St.

01/23/2024

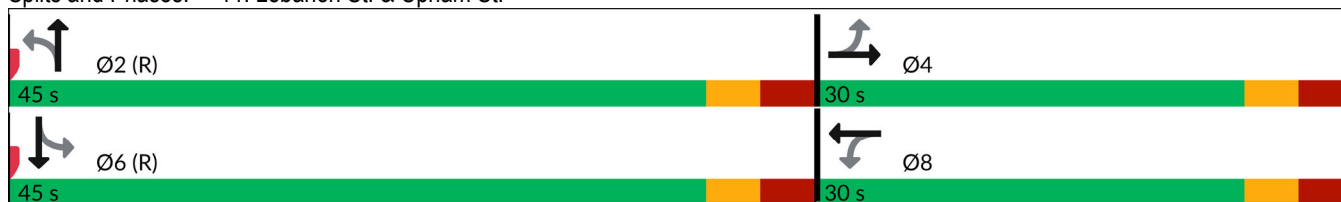


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|------|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 0.38 | | 0.65 | 0.43 | | | 0.64 | | | 0.62 | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 75 |
| Actuated Cycle Length: | 75 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 65 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.72 |
| Intersection Signal Delay (s/veh): | 20.3 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 105.8% |
| ICU Level of Service | G |
| Analysis Period (min) | 15 |

Splits and Phases: 11: Lebanon St. & Upham St.



TIP Before and After Evaluations - Melrose - Lebanon Street PM
 14: Lebanon St. & E. Emerson St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Volume (vph) | 21 | 84 | 67 | 7 | 74 | 14 | 43 | 341 | 8 | 15 | 263 | 25 |
| Future Volume (vph) | 21 | 84 | 67 | 7 | 74 | 14 | 43 | 341 | 8 | 15 | 263 | 25 |
| 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 | | 0.947 | | | 0.980 | | | 0.997 | | | 0.989 | |
| Flt Protected | | 0.994 | | | 0.996 | | | 0.995 | | | 0.998 | |
| Satd. Flow (prot) | 0 | 1720 | 0 | 0 | 1818 | 0 | 0 | 1866 | 0 | 0 | 1839 | 0 |
| Flt Permitted | | 0.949 | | | 0.970 | | | 0.925 | | | 0.970 | |
| Satd. Flow (perm) | 0 | 1642 | 0 | 0 | 1771 | 0 | 0 | 1735 | 0 | 0 | 1787 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 45 | | | 12 | | | 2 | | | 7 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 272 | | | 331 | | | 673 | | | 588 | |
| Travel Time (s) | | 6.2 | | | 7.5 | | | 15.3 | | | 13.4 | |
| Peak Hour Factor | 0.72 | 0.72 | 0.72 | 0.76 | 0.76 | 0.76 | 0.80 | 0.80 | 0.80 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Adj. Flow (vph) | 29 | 117 | 93 | 9 | 97 | 18 | 54 | 426 | 10 | 18 | 317 | 30 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 239 | 0 | 0 | 124 | 0 | 0 | 490 | 0 | 0 | 365 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM

14: Lebanon St. & E. Emerson St.

01/23/2024



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|-------|-----|
| Minimum Initial (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Minimum Split (s) | 26.0 | 26.0 | | 26.0 | 26.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Total Split (s) | 40.0 | 40.0 | | 40.0 | 40.0 | | 45.0 | 45.0 | | 45.0 | 45.0 | |
| Total Split (%) | 47.1% | 47.1% | | 47.1% | 47.1% | | 52.9% | 52.9% | | 52.9% | 52.9% | |
| Maximum Green (s) | 34.0 | 34.0 | | 34.0 | 34.0 | | 39.0 | 39.0 | | 39.0 | 39.0 | |
| Yellow Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.0 | | | 6.0 | | | 6.0 | | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 20.5 | | | 20.5 | | | 52.5 | | | 52.5 | |
| Actuated g/C Ratio | | 0.24 | | | 0.24 | | | 0.62 | | | 0.62 | |
| v/c Ratio | | 0.56 | | | 0.29 | | | 0.46 | | | 0.33 | |
| Control Delay (s/veh) | | 28.2 | | | 25.5 | | | 10.5 | | | 8.8 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay (s/veh) | | 28.2 | | | 25.5 | | | 10.5 | | | 8.8 | |
| LOS | | C | | | C | | | B | | | A | |
| Approach Delay (s/veh) | | 28.2 | | | 25.5 | | | 10.5 | | | 8.8 | |
| Approach LOS | | C | | | C | | | B | | | A | |
| 90th %ile Green (s) | 22.4 | 22.4 | | 22.4 | 22.4 | | 50.6 | 50.6 | | 50.6 | 50.6 | |
| 90th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 70th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 50th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 30th %ile Term Code | Min | Min | | Min | Min | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| 10th %ile Term Code | Min | Min | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| Stops (vph) | | 121 | | | 67 | | | 198 | | | 134 | |
| Fuel Used(gal) | | 2 | | | 1 | | | 4 | | | 3 | |
| CO Emissions (g/hr) | | 141 | | | 77 | | | 279 | | | 218 | |
| NOx Emissions (g/hr) | | 27 | | | 15 | | | 54 | | | 42 | |
| VOC Emissions (g/hr) | | 33 | | | 18 | | | 65 | | | 50 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 0 | | | 0 | |
| Queue Length 50th (ft) | | 91 | | | 49 | | | 123 | | | 81 | |
| Queue Length 95th (ft) | | 116 | | | 75 | | | 172 | | | 125 | |
| Internal Link Dist (ft) | | 192 | | | 251 | | | 593 | | | 508 | |
| Turn Bay Length (ft) | | | | | | | | | | | | |
| Base Capacity (vph) | | 683 | | | 715 | | | 1072 | | | 1106 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |

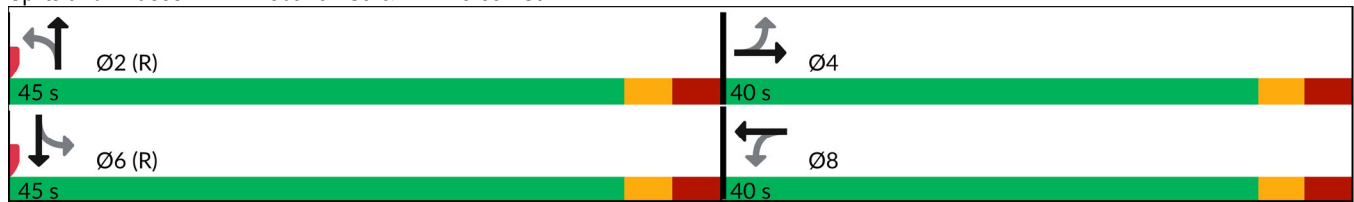


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|
| Reduced v/c Ratio | | 0.35 | | | 0.17 | | | 0.46 | | | 0.33 | |

Intersection Summary
















| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 85 |
| Actuated Cycle Length: | 85 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 55 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.56 |
| Intersection Signal Delay (s/veh): | 15.0 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 60.6% |
| ICU Level of Service | B |
| Analysis Period (min) | 15 |

Splits and Phases: 14: Lebanon St. & E. Emerson St.



TIP Before and After Evaluations - Melrose - Lebanon Street PM
 17: Main St/Main St. & Lebanon St. & Porter St.

01/23/2024

| |  |  |  |  |  |  |  |  |  |  |  | |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|--|
| Lane Group | WBL | WBR | NBT | NBR | NBR2 | SBL2 | SBL | SBT | NWL | NWR | NWR2 | |
| Lane Configurations | | |  | | | |  |  | |  | | |
| Traffic Volume (vph) | 0 | 0 | 346 | 13 | 2 | 31 | 320 | 380 | 0 | 346 | 13 | |
| Future Volume (vph) | 0 | 0 | 346 | 13 | 2 | 31 | 320 | 380 | 0 | 346 | 13 | |
| Ideal Flow (vphpl) | 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 | |
| Frt | | | 0.994 | | | | | | | 0.865 | | |
| Flt Protected | | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 0 | 1852 | 0 | 0 | 0 | 1770 | 1863 | 0 | 1611 | 0 | |
| Flt Permitted | | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 0 | 0 | 1852 | 0 | 0 | 0 | 1770 | 1863 | 0 | 1611 | 0 | |
| Right Turn on Red | | Yes | | | Yes | | | | | | Yes | |
| Satd. Flow (RTOR) | | | | | | | | | | 65 | | |
| Link Speed (mph) | 30 | | 30 | | | | | 30 | 30 | | | |
| Link Distance (ft) | 409 | | 491 | | | | | 318 | 187 | | | |
| Travel Time (s) | 9.3 | | 11.2 | | | | | 7.2 | 4.3 | | | |
| 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 | |
| Adj. Flow (vph) | 0 | 0 | 376 | 14 | 2 | 34 | 348 | 413 | 0 | 376 | 14 | |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 392 | 0 | 0 | 0 | 382 | 413 | 0 | 390 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Right | Right | Left | Left | Left | Left | Right | Right | |
| Median Width(ft) | 0 | | 12 | | | | | 18 | 0 | | | |
| Link Offset(ft) | 0 | | 0 | | | | | 0 | 0 | | | |
| Crosswalk Width(ft) | 16 | | 16 | | | | | 16 | 16 | | | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | 15 | 9 | | 9 | 9 | 15 | 60 | | 15 | 60 | 9 | |
| Number of Detectors | | | 2 | | | 1 | 1 | 2 | | 1 | | |
| Detector Template | | | Thru | | | Left | Left | Thru | | Right | | |
| Leading Detector (ft) | | | 100 | | | 20 | 20 | 100 | | 20 | | |
| Trailing Detector (ft) | | | 0 | | | 0 | 0 | 0 | | 0 | | |
| Detector 1 Position(ft) | | | 0 | | | 0 | 0 | 0 | | 0 | | |
| Detector 1 Size(ft) | | | 6 | | | 20 | 20 | 6 | | 20 | | |
| Detector 1 Type | | | Cl+Ex | | | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | | 0.0 | | | 0.0 | 0.0 | 0.0 | | 0.0 | | |
| Detector 1 Queue (s) | | | 0.0 | | | 0.0 | 0.0 | 0.0 | | 0.0 | | |
| Detector 1 Delay (s) | | | 0.0 | | | 0.0 | 0.0 | 0.0 | | 0.0 | | |
| Detector 2 Position(ft) | | | 94 | | | | | 94 | | | | |
| Detector 2 Size(ft) | | | 6 | | | | | 6 | | | | |
| Detector 2 Type | | | Cl+Ex | | | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | | | 0.0 | | | | |
| Turn Type | | | NA | | | Prot | Prot | NA | | Prot | | |
| Protected Phases | | | 2 | | | 1 | 1 | 6 | | 4 | | |
| Permitted Phases | | | | | | | | | | | | |
| Detector Phase | | | 2 | | | 1 | 1 | 6 | | 4 | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | 15.0 | | | 10.0 | 10.0 | 8.0 | | 15.0 | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 17: Main St/Main St. & Lebanon St. & Porter St.

01/23/2024

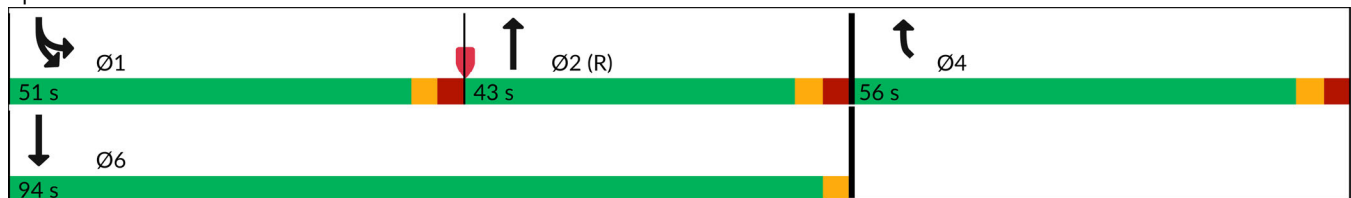


| Lane Group | WBL | WBR | NBT | NBR | NBR2 | SBL2 | SBL | SBT | NWL | NWR | NWR2 |
|-------------------------|-----|-----|-------|-----|------|-------|-------|-------|------|-------|------|
| Minimum Split (s) | | | 29.0 | | | 29.0 | 29.0 | 26.0 | | 29.0 | |
| Total Split (s) | | | 43.0 | | | 51.0 | 51.0 | 94.0 | | 56.0 | |
| Total Split (%) | | | 28.7% | | | 34.0% | 34.0% | 62.7% | | 37.3% | |
| Maximum Green (s) | | | 37.0 | | | 45.0 | 45.0 | 91.0 | | 50.0 | |
| Yellow Time (s) | | | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | |
| All-Red Time (s) | | | 3.0 | | | 3.0 | 3.0 | 0.0 | | 3.0 | |
| Lost Time Adjust (s) | | | 0.0 | | | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | | 6.0 | | | | 6.0 | 3.0 | | 6.0 | |
| Lead/Lag | | | Lag | | | Lead | Lead | | | | |
| Lead-Lag Optimize? | | | Yes | | | Yes | Yes | | | | |
| Vehicle Extension (s) | | | 3.0 | | | 3.0 | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | | | C-Max | | | None | None | None | | None | |
| Walk Time (s) | | | 12.0 | | | 12.0 | 12.0 | 12.0 | | 12.0 | |
| 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) | | | 57.5 | | | | 37.4 | 103.9 | | 37.1 | |
| Actuated g/C Ratio | | | 0.38 | | | | 0.25 | 0.69 | | 0.25 | |
| v/c Ratio | | | 0.55 | | | | 0.87 | 0.32 | | 0.87 | |
| Control Delay (s/veh) | | | 43.3 | | | | 73.0 | 11.0 | | 64.5 | |
| Queue Delay | | | 0.0 | | | | 56.2 | 3.9 | | 0.0 | |
| Total Delay (s/veh) | | | 43.3 | | | | 129.1 | 14.9 | | 64.5 | |
| LOS | | | D | | | | F | B | | E | |
| Approach Delay (s/veh) | | | 43.3 | | | | | 69.8 | 64.5 | | |
| Approach LOS | | | D | | | | | E | E | | |
| 90th %ile Green (s) | | | 37.0 | | | 46.5 | 46.5 | 92.5 | | 48.5 | |
| 90th %ile Term Code | | | Coord | | | Max | Max | Coord | | Gap | |
| 70th %ile Green (s) | | | 48.2 | | | 41.7 | 41.7 | 98.9 | | 42.1 | |
| 70th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| 50th %ile Green (s) | | | 56.9 | | | 37.8 | 37.8 | 103.7 | | 37.3 | |
| 50th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| 30th %ile Green (s) | | | 65.9 | | | 33.7 | 33.7 | 108.6 | | 32.4 | |
| 30th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| 10th %ile Green (s) | | | 79.4 | | | 27.5 | 27.5 | 115.9 | | 25.1 | |
| 10th %ile Term Code | | | Coord | | | Gap | Gap | Coord | | Gap | |
| Stops (vph) | | | 275 | | | | 329 | 150 | | 289 | |
| Fuel Used(gal) | | | 6 | | | | 8 | 3 | | 8 | |
| CO Emissions (g/hr) | | | 425 | | | | 552 | 183 | | 593 | |
| NOx Emissions (g/hr) | | | 83 | | | | 107 | 36 | | 115 | |
| VOC Emissions (g/hr) | | | 99 | | | | 128 | 43 | | 137 | |
| Dilemma Vehicles (#) | | | 0 | | | | 0 | 0 | | 0 | |
| Queue Length 50th (ft) | | | 301 | | | | 359 | 148 | | 314 | |
| Queue Length 95th (ft) | | | #545 | | | | 453 | 258 | | 407 | |
| Internal Link Dist (ft) | 329 | | 411 | | | | | 238 | 107 | | |
| Turn Bay Length (ft) | | | | | | | | | | | |
| Base Capacity (vph) | | | 709 | | | | 534 | 1290 | | 580 | |
| Starvation Cap Reductn | | | 0 | | | | 200 | 776 | | 0 | |
| Spillback Cap Reductn | | | 0 | | | | 0 | 0 | | 0 | |
| Storage Cap Reductn | | | 0 | | | | 0 | 0 | | 0 | |
| Reduced v/c Ratio | | | 0.55 | | | | 1.14 | 0.80 | | 0.67 | |

Intersection Summary

| | |
|---|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:NBT, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.87 |
| Intersection Signal Delay (s/veh): | 61.9 |
| Intersection LOS: | E |
| Intersection Capacity Utilization | 74.7% |
| 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: 17: Main St/Main St. & Lebanon St. & Porter St.



TIP Before and After Evaluations - Melrose - Lebanon Street PM
 20: Main St. & Green St.

01/23/2024



| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR | SWR2 |
|----------------------------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | ↕ | | | ↑ | | ↙ | | |
| Traffic Volume (vph) | 0 | 0 | 11 | 462 | 232 | 0 | 613 | 0 | 132 | 0 | 5 |
| Future Volume (vph) | 0 | 0 | 11 | 462 | 232 | 0 | 613 | 0 | 132 | 0 | 5 |
| Ideal Flow (vphpl) | 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 |
| Fr _t | | | | 0.955 | | | | | 0.995 | | |
| Fl _t Protected | | | | 0.999 | | | | | 0.954 | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 1777 | 0 | 0 | 1845 | 0 | 1734 | 0 | 0 |
| Fl _t Permitted | | | | 0.989 | | | | | 0.954 | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 1759 | 0 | 0 | 1845 | 0 | 1734 | 0 | 0 |
| Right Turn on Red | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | 49 | | | | | 29 | | |
| Link Speed (mph) | 30 | | | 30 | | | 30 | | 30 | | |
| Link Distance (ft) | 512 | | | 318 | | | 518 | | 148 | | |
| Travel Time (s) | 11.6 | | | 7.2 | | | 11.8 | | 3.4 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.82 | 0.82 | 0.86 | 0.86 | 0.92 | 0.85 | 0.92 | 0.85 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 3% | 3% | 2% | 4% | 2% | 4% |
| Adj. Flow (vph) | 0 | 0 | 12 | 563 | 283 | 0 | 713 | 0 | 155 | 0 | 6 |
| Shared Lane Traffic (%) | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 858 | 0 | 0 | 713 | 0 | 161 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Right | Left | Left | Right | Left | Right | Right |
| Median Width(ft) | 0 | | | 0 | | | 0 | | 12 | | |
| Link Offset(ft) | 0 | | | 0 | | | 12 | | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | | | 16 | | 16 | | |
| Two way Left Turn Lane | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 60 | 60 | 60 | | 9 | 15 | | 60 | 15 | 60 | 9 |
| Number of Detectors | | | 1 | 2 | | | 2 | | 1 | | |
| Detector Template | | | Left | Thru | | | Thru | | Left | | |
| Leading Detector (ft) | | | 20 | 100 | | | 100 | | 20 | | |
| Trailing Detector (ft) | | | 0 | 0 | | | 0 | | 0 | | |
| Detector 1 Position(ft) | | | 0 | 0 | | | 0 | | 0 | | |
| Detector 1 Size(ft) | | | 20 | 6 | | | 6 | | 20 | | |
| Detector 1 Type | | | Cl+Ex | Cl+Ex | | | Cl+Ex | | Cl+Ex | | |
| Detector 1 Channel | | | | | | | | | | | |
| Detector 1 Extend (s) | | | 0.0 | 0.0 | | | 0.0 | | 0.0 | | |
| Detector 1 Queue (s) | | | 0.0 | 0.0 | | | 0.0 | | 0.0 | | |
| Detector 1 Delay (s) | | | 0.0 | 0.0 | | | 0.0 | | 0.0 | | |
| Detector 2 Position(ft) | | | | 94 | | | 94 | | | | |
| Detector 2 Size(ft) | | | | 6 | | | 6 | | | | |
| Detector 2 Type | | | | Cl+Ex | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | | | 0.0 | | | | |
| Turn Type | | | Perm | NA | | | NA | | Prot | | |
| Protected Phases | | | | 2 | | | 6 | | 8 | | |
| Permitted Phases | | | 2 | | | | | | | | |
| Detector Phase | | | 2 | 2 | | | 6 | | 8 | | |
| Switch Phase | | | | | | | | | | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 20: Main St. & Green St.

01/23/2024



| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR | SWR2 |
|-------------------------|-----|-----|-------|-------|-----|-----|-------|-----|-------|-----|------|
| Minimum Initial (s) | | | 66.0 | 66.0 | | | 63.0 | | 10.0 | | |
| Minimum Split (s) | | | 72.0 | 72.0 | | | 69.0 | | 24.0 | | |
| Total Split (s) | | | 83.0 | 83.0 | | | 83.0 | | 30.0 | | |
| Total Split (%) | | | 73.5% | 73.5% | | | 73.5% | | 26.5% | | |
| Maximum Green (s) | | | 77.0 | 77.0 | | | 77.0 | | 24.0 | | |
| Yellow Time (s) | | | 3.0 | 3.0 | | | 3.0 | | 3.0 | | |
| All-Red Time (s) | | | 3.0 | 3.0 | | | 3.0 | | 3.0 | | |
| Lost Time Adjust (s) | | | | 0.0 | | | 0.0 | | 0.0 | | |
| Total Lost Time (s) | | | | 6.0 | | | 6.0 | | 6.0 | | |
| Lead/Lag | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | |
| Vehicle Extension (s) | | | 3.0 | 3.0 | | | 3.0 | | 3.0 | | |
| Recall Mode | | | C-Max | C-Max | | | C-Max | | None | | |
| Walk Time (s) | | | 4.0 | 4.0 | | | 4.0 | | 4.0 | | |
| Flash Dont Walk (s) | | | 11.0 | 11.0 | | | 11.0 | | 11.0 | | |
| Pedestrian Calls (#/hr) | | | 0 | 0 | | | 0 | | 0 | | |
| Act Effct Green (s) | | | | 86.6 | | | 86.6 | | 14.4 | | |
| Actuated g/C Ratio | | | | 0.77 | | | 0.77 | | 0.13 | | |
| v/c Ratio | | | | 0.63 | | | 0.50 | | 0.65 | | |
| Control Delay (s/veh) | | | | 8.7 | | | 7.0 | | 50.4 | | |
| Queue Delay | | | | 13.8 | | | 0.0 | | 0.0 | | |
| Total Delay (s/veh) | | | | 22.5 | | | 7.0 | | 50.4 | | |
| LOS | | | | C | | | A | | D | | |
| Approach Delay (s/veh) | | | | 22.5 | | | 7.0 | | 50.4 | | |
| Approach LOS | | | | C | | | A | | D | | |
| 90th %ile Green (s) | | | 81.0 | 81.0 | | | 81.0 | | 20.0 | | |
| 90th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 70th %ile Green (s) | | | 84.5 | 84.5 | | | 84.5 | | 16.5 | | |
| 70th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 50th %ile Green (s) | | | 87.0 | 87.0 | | | 87.0 | | 14.0 | | |
| 50th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 30th %ile Green (s) | | | 89.4 | 89.4 | | | 89.4 | | 11.6 | | |
| 30th %ile Term Code | | | Coord | Coord | | | Coord | | Gap | | |
| 10th %ile Green (s) | | | 91.0 | 91.0 | | | 91.0 | | 10.0 | | |
| 10th %ile Term Code | | | Coord | Coord | | | Coord | | Min | | |
| Stops (vph) | | | | 300 | | | 224 | | 106 | | |
| Fuel Used(gal) | | | | 5 | | | 5 | | 3 | | |
| CO Emissions (g/hr) | | | | 326 | | | 321 | | 180 | | |
| NOx Emissions (g/hr) | | | | 63 | | | 62 | | 35 | | |
| VOC Emissions (g/hr) | | | | 75 | | | 74 | | 42 | | |
| Dilemma Vehicles (#) | | | | 0 | | | 0 | | 0 | | |
| Queue Length 50th (ft) | | | | 216 | | | 162 | | 93 | | |
| Queue Length 95th (ft) | | | | 331 | | | 271 | | 144 | | |
| Internal Link Dist (ft) | 432 | | | 238 | | | 438 | | 68 | | |
| Turn Bay Length (ft) | | | | | | | | | | | |
| Base Capacity (vph) | | | | 1359 | | | 1413 | | 391 | | |
| Starvation Cap Reductn | | | | 492 | | | 0 | | 0 | | |
| Spillback Cap Reductn | | | | 0 | | | 0 | | 0 | | |
| Storage Cap Reductn | | | | 0 | | | 0 | | 0 | | |

TIP Before and After Evaluations - Melrose - Lebanon Street PM

20: Main St. & Green St.

01/23/2024

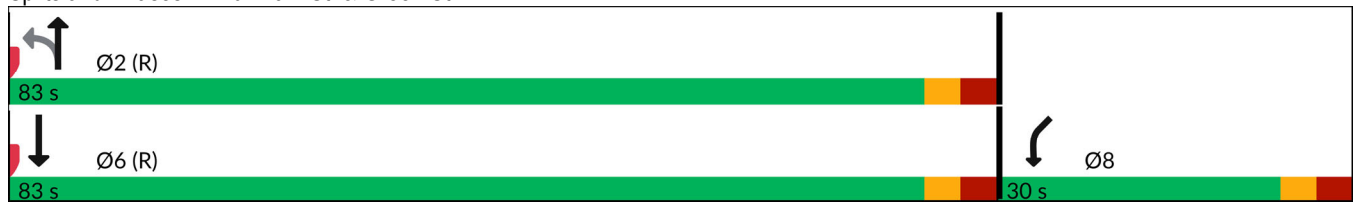


| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR | SWR2 |
|-------------------|-----|-----|-----|------|-----|-----|------|-----|------|-----|------|
| Reduced v/c Ratio | | | | 0.99 | | | 0.50 | | 0.41 | | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 113 |
| Actuated Cycle Length: | 113 |
| Offset: | 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green |
| Natural Cycle: | 100 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.65 |
| Intersection Signal Delay (s/veh): | 18.7 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 73.3% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

Splits and Phases: 20: Main St. & Green St.



TIP Before and After Evaluations - Melrose - Lebanon Street PM
 22: Lebanon St.

01/23/2024



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 18 | 9 | 541 | 45 | 0 | 485 |
| Future Volume (vph) | 18 | 9 | 541 | 45 | 0 | 485 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.955 | | 0.990 | | | |
| Flt Protected | 0.968 | | | | | |
| Satd. Flow (prot) | 1722 | 0 | 1844 | 0 | 0 | 1863 |
| Flt Permitted | 0.968 | | | | | |
| Satd. Flow (perm) | 1722 | 0 | 1844 | 0 | 0 | 1863 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 231 | | 284 | | | 116 |
| Travel Time (s) | 4.6 | | 5.3 | | | 2.5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 20 | 10 | 588 | 49 | 0 | 527 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 30 | 0 | 637 | 0 | 0 | 527 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 60 | 60 | | 60 | 60 | |
| Sign Control | Stop | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 41.2% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

TIP Before and After Evaluations - Melrose - Lebanon Street PM
 24: Lebanon St.

01/23/2024



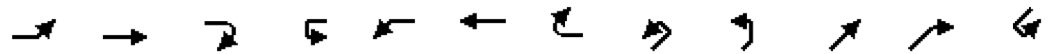
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|----------------------------|-------|-------|------|-------|------|-------|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 4 | 6 | 0 | 551 | 475 | 2 |
| Future Volume (vph) | 4 | 6 | 0 | 551 | 475 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.914 | | | 0.999 | | |
| Flt Protected | 0.982 | | | | | |
| Satd. Flow (prot) | 1672 | 0 | 0 | 1863 | 1861 | 0 |
| Flt Permitted | 0.982 | | | | | |
| Satd. Flow (perm) | 1672 | 0 | 0 | 1863 | 1861 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 251 | | | 116 | 341 | |
| Travel Time (s) | 4.3 | | | 2.5 | 8.5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 4 | 7 | 0 | 599 | 516 | 2 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 11 | 0 | 0 | 599 | 518 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 0 | 0 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 60 | 60 | 60 | | | 60 |
| Sign Control | Stop | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 39.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

TIP Before and After Evaluations - Somerville - Broadway AM
 3: McGrath Highway & Broadway

12/20/2023



| Lane Group | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NEU | NEL | NET | NER | SWU |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 395 | 242 | 330 | 2 | 91 | 148 | 138 | 10 | 100 | 710 | 31 | 29 |
| Future Volume (vph) | 395 | 242 | 330 | 2 | 91 | 148 | 138 | 10 | 100 | 710 | 31 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 250 | | 200 | | 175 | | 0 | | 300 | | 0 | |
| Storage Lanes | 1 | | 1 | | 1 | | 1 | | 1 | | 0 | |
| Taper Length (ft) | 25 | | | | 25 | | | | 25 | | | |
| Lane Util. Factor | 0.86 | 0.86 | 1.00 | 0.95 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.91 |
| Frt | | | 0.850 | | | | 0.850 | | | 0.994 | | |
| Flt Protected | 0.950 | 0.978 | | | 0.950 | 0.996 | | | 0.950 | | | |
| Satd. Flow (prot) | 1507 | 4655 | 1568 | 0 | 1595 | 3344 | 1568 | 0 | 1752 | 5006 | 0 | 0 |
| Flt Permitted | 0.950 | 0.978 | | | 0.950 | 0.996 | | | 0.950 | | | |
| Satd. Flow (perm) | 1507 | 4655 | 1568 | 0 | 1595 | 3344 | 1568 | 0 | 1752 | 5006 | 0 | 0 |
| Right Turn on Red | | | No | | | | Yes | | | | No | |
| Satd. Flow (RTOR) | | | | | | | 215 | | | | | |
| Link Speed (mph) | | 25 | | | | 25 | | | | 25 | | |
| Link Distance (ft) | | 770 | | | | 417 | | | | 1300 | | |
| Travel Time (s) | | 21.0 | | | | 11.4 | | | | 35.5 | | |
| 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 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| Adj. Flow (vph) | 429 | 263 | 359 | 2 | 99 | 161 | 150 | 11 | 109 | 772 | 34 | 32 |
| Shared Lane Traffic (%) | 50% | | | | 16% | | | | | | | |
| Lane Group Flow (vph) | 214 | 478 | 359 | 0 | 85 | 177 | 150 | 0 | 120 | 806 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | R NA | Left | Left | Right | R NA | Left | Left | Right | R NA |
| Median Width(ft) | | 12 | | | | 12 | | | | 12 | | |
| Link Offset(ft) | | 0 | | | | 0 | | | | 0 | | |
| Crosswalk Width(ft) | | 16 | | | | 16 | | | | 16 | | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 9 | 15 | | 9 | 9 | 15 | | 9 | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | | 1 |
| Detector Template | Left | Thru | Right | Left | Left | Thru | Right | Left | Left | Thru | | Left |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 20 | 100 | 20 | 20 | 20 | 100 | | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 20 | 6 | 20 | 20 | 20 | 100 | | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 |
| Detector 2 Position(ft) | | 94 | | | | 94 | | | | | | |
| Detector 2 Size(ft) | | 6 | | | | 6 | | | | | | |
| Detector 2 Type | | Cl+Ex | | | | Cl+Ex | | | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | 0.0 | | | | | | |
| Turn Type | Split | NA | Perm | Split | Split | NA | Free | Prot | Prot | NA | | Prot |
| Protected Phases | 4 | 4 | | 8 | 8 | 8 | | 5 | 5 | 2 | | 1 |

TIP Before and After Evaluations - Somerville - Broadway AM
 3: McGrath Highway & Broadway

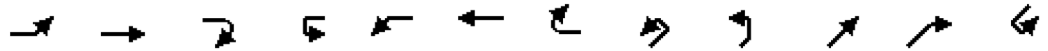
12/20/2023



| Lane Group | SWL | SWT | SWR |
|----------------------------|-------|-------|-------|
| Lane Configurations | | | |
| Traffic Volume (vph) | 72 | 1663 | 69 |
| Future Volume (vph) | 72 | 1663 | 69 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 |
| Storage Length (ft) | 250 | | 0 |
| Storage Lanes | 1 | | 0 |
| Taper Length (ft) | 100 | | |
| Lane Util. Factor | 1.00 | 0.91 | 0.91 |
| Frt | | 0.994 | |
| Flt Protected | 0.950 | | |
| Satd. Flow (prot) | 1752 | 5006 | 0 |
| Flt Permitted | 0.950 | | |
| Satd. Flow (perm) | 1752 | 5006 | 0 |
| Right Turn on Red | | | No |
| Satd. Flow (RTOR) | | | |
| Link Speed (mph) | | 25 | |
| Link Distance (ft) | | 1141 | |
| Travel Time (s) | | 31.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 3% | 3% | 3% |
| Adj. Flow (vph) | 78 | 1808 | 75 |
| Shared Lane Traffic (%) | | | |
| Lane Group Flow (vph) | 110 | 1883 | 0 |
| Enter Blocked Intersection | No | No | No |
| Lane Alignment | Left | Left | Right |
| Median Width(ft) | | 12 | |
| Link Offset(ft) | | 0 | |
| Crosswalk Width(ft) | | 16 | |
| Two way Left Turn Lane | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 |
| Number of Detectors | 1 | 2 | |
| Detector Template | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | |
| Detector 2 Size(ft) | | 6 | |
| Detector 2 Type | | Cl+Ex | |
| Detector 2 Channel | | | |
| Detector 2 Extend (s) | | 0.0 | |
| Turn Type | Prot | NA | |
| Protected Phases | 1 | 6 | |

TIP Before and After Evaluations - Somerville - Broadway AM
 3: McGrath Highway & Broadway

12/20/2023



| Lane Group | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NEU | NEL | NET | NER | SWU |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|
| Permitted Phases | 4 | | | Free | | | | | | | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 8 | | 5 | 5 | 2 | | 1 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 6.0 | 10.0 | | 6.0 |
| Minimum Split (s) | 38.5 | 38.5 | 38.5 | 36.5 | 36.5 | 36.5 | | 12.5 | 12.5 | 32.5 | | 12.5 |
| Total Split (s) | 38.5 | 38.5 | 38.5 | 36.5 | 36.5 | 36.5 | | 16.7 | 16.7 | 50.9 | | 24.1 |
| Total Split (%) | 25.7% | 25.7% | 25.7% | 24.3% | 24.3% | 24.3% | | 11.1% | 11.1% | 33.9% | | 16.1% |
| Maximum Green (s) | 32.0 | 32.0 | 32.0 | 30.0 | 30.0 | 30.0 | | 10.2 | 10.2 | 44.4 | | 17.6 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | | 3.5 |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 6.5 | 6.5 | | | 6.5 | 6.5 | | |
| Lead/Lag | | | | | | | Lead | Lead | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | Yes | Yes | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 |
| Recall Mode | None | None | None | None | None | None | | None | None | C-Max | | None |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | | | 7.0 | | |
| Flash Dont Walk (s) | 25.0 | 25.0 | 25.0 | 23.0 | 23.0 | 23.0 | | | | 19.0 | | |
| Pedestrian Calls (#/hr) | 8 | 8 | 8 | 7 | 7 | 7 | | | | 32 | | |
| Act Effct Green (s) | 32.0 | 32.0 | 32.0 | | 16.1 | 16.1 | 150.0 | | 16.2 | 61.7 | | |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | | 0.11 | 0.11 | 1.00 | | 0.11 | 0.41 | | |
| v/c Ratio | 0.67 | 0.48 | 1.07 | | 0.50 | 0.49 | 0.10 | | 0.63 | 0.39 | | |
| Control Delay (s/veh) | 65.5 | 53.6 | 124.9 | | 71.1 | 66.4 | 0.1 | | 78.4 | 33.3 | | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | |
| Total Delay (s/veh) | 65.5 | 53.6 | 124.9 | | 71.1 | 66.4 | 0.1 | | 78.4 | 33.3 | | |
| LOS | E | D | F | | E | E | A | | E | C | | |
| Approach Delay (s/veh) | 80.4 | | | | | | 43.2 | | | 39.1 | | |
| Approach LOS | F | | | | | | D | | | D | | |
| 90th %ile Green (s) | 32.0 | 32.0 | 32.0 | 30.0 | 30.0 | 30.0 | | 10.2 | 10.2 | 44.4 | | 17.6 |
| 90th %ile Term Code | Max | Max | Max | Ped | Ped | Ped | | Max | Max | Coord | | Max |
| 70th %ile Green (s) | 32.0 | 32.0 | 32.0 | 15.6 | 15.6 | 15.6 | | 19.3 | 19.3 | 59.4 | | 17.0 |
| 70th %ile Term Code | Max | Max | Max | Gap | Gap | Gap | | Gap | Gap | Coord | | Gap |
| 50th %ile Green (s) | 32.0 | 32.0 | 32.0 | 13.3 | 13.3 | 13.3 | | 18.3 | 18.3 | 64.0 | | 14.7 |
| 50th %ile Term Code | Max | Max | Max | Gap | Gap | Gap | | Gap | Gap | Coord | | Gap |
| 30th %ile Green (s) | 32.0 | 32.0 | 32.0 | 11.8 | 11.8 | 11.8 | | 17.4 | 17.4 | 67.8 | | 12.4 |
| 30th %ile Term Code | Max | Max | Max | Gap | Gap | Gap | | Gap | Gap | Coord | | Gap |
| 10th %ile Green (s) | 32.0 | 32.0 | 32.0 | 10.0 | 10.0 | 10.0 | | 16.0 | 16.0 | 72.9 | | 9.1 |
| 10th %ile Term Code | Max | Max | Max | Min | Min | Min | | Gap | Gap | Coord | | Gap |
| Stops (vph) | 180 | 378 | 280 | | 72 | 147 | 0 | | 92 | 516 | | |
| Fuel Used(gal) | 5 | 9 | 12 | | 2 | 3 | 0 | | 3 | 15 | | |
| CO Emissions (g/hr) | 322 | 639 | 813 | | 118 | 234 | 35 | | 233 | 1064 | | |
| NOx Emissions (g/hr) | 63 | 124 | 158 | | 23 | 46 | 7 | | 45 | 207 | | |
| VOC Emissions (g/hr) | 75 | 148 | 188 | | 27 | 54 | 8 | | 54 | 247 | | |
| Dilemma Vehicles (#) | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | |
| Queue Length 50th (ft) | 225 | 160 | ~389 | | 89 | 93 | 0 | | 112 | 195 | | |
| Queue Length 95th (ft) | 337 | 203 | #596 | | 136 | 120 | 0 | | #259 | 290 | | |
| Internal Link Dist (ft) | 690 | | | | | | 337 | | | 1220 | | |
| Turn Bay Length (ft) | 250 | | 200 | | 175 | | | | 300 | | | |
| Base Capacity (vph) | 321 | 993 | 334 | | 319 | 668 | 1568 | | 189 | 2058 | | |

TIP Before and After Evaluations - Somerville - Broadway AM
 3: McGrath Highway & Broadway

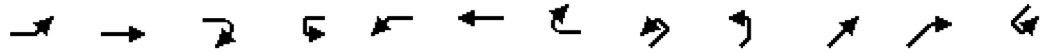
12/20/2023



| Lane Group | SWL | SWT | SWR |
|-------------------------|-------|-------|-----|
| Permitted Phases | | | |
| Detector Phase | 1 | 6 | |
| Switch Phase | | | |
| Minimum Initial (s) | 6.0 | 10.0 | |
| Minimum Split (s) | 12.5 | 38.5 | |
| Total Split (s) | 24.1 | 58.3 | |
| Total Split (%) | 16.1% | 38.9% | |
| Maximum Green (s) | 17.6 | 51.8 | |
| Yellow Time (s) | 3.5 | 3.5 | |
| All-Red Time (s) | 3.0 | 3.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.5 | |
| Lead/Lag | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | |
| Walk Time (s) | | 7.0 | |
| Flash Dont Walk (s) | | 25.0 | |
| Pedestrian Calls (#/hr) | | 23 | |
| Act Effct Green (s) | 14.2 | 59.6 | |
| Actuated g/C Ratio | 0.09 | 0.40 | |
| v/c Ratio | 0.67 | 0.95 | |
| Control Delay (s/veh) | 84.5 | 54.6 | |
| Queue Delay | 0.0 | 0.0 | |
| Total Delay (s/veh) | 84.5 | 54.6 | |
| LOS | F | D | |
| Approach Delay (s/veh) | | 56.2 | |
| Approach LOS | | E | |
| 90th %ile Green (s) | 17.6 | 51.8 | |
| 90th %ile Term Code | Max | Coord | |
| 70th %ile Green (s) | 17.0 | 57.1 | |
| 70th %ile Term Code | Gap | Coord | |
| 50th %ile Green (s) | 14.7 | 60.4 | |
| 50th %ile Term Code | Gap | Coord | |
| 30th %ile Green (s) | 12.4 | 62.8 | |
| 30th %ile Term Code | Gap | Coord | |
| 10th %ile Green (s) | 9.1 | 66.0 | |
| 10th %ile Term Code | Gap | Coord | |
| Stops (vph) | 97 | 1495 | |
| Fuel Used(gal) | 3 | 42 | |
| CO Emissions (g/hr) | 216 | 2923 | |
| NOx Emissions (g/hr) | 42 | 569 | |
| VOC Emissions (g/hr) | 50 | 677 | |
| Dilemma Vehicles (#) | 0 | 0 | |
| Queue Length 50th (ft) | 105 | 642 | |
| Queue Length 95th (ft) | 172 | #851 | |
| Internal Link Dist (ft) | | 1061 | |
| Turn Bay Length (ft) | 250 | | |
| Base Capacity (vph) | 205 | 1989 | |

TIP Before and After Evaluations - Somerville - Broadway AM
 3: McGrath Highway & Broadway

12/20/2023

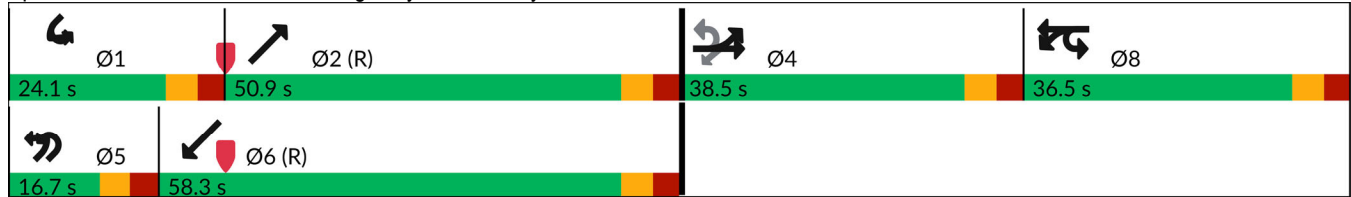


| Lane Group | EBL | EBT | EBR | WBU | WBL | WBT | WBR | NEU | NEL | NET | NER | SWU |
|------------------------|------|------|------|-----|------|------|------|-----|------|------|-----|-----|
| Starvation Cap Reductn | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | |
| Spillback Cap Reductn | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | |
| Storage Cap Reductn | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | |
| Reduced v/c Ratio | 0.67 | 0.48 | 1.07 | | 0.27 | 0.26 | 0.10 | | 0.63 | 0.39 | | |

Intersection Summary

| | |
|---|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green |
| Natural Cycle: | 150 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.07 |
| Intersection Signal Delay (s/veh): | 57.2 |
| Intersection LOS: | E |
| Intersection Capacity Utilization: | 90.2% |
| 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: McGrath Highway & Broadway



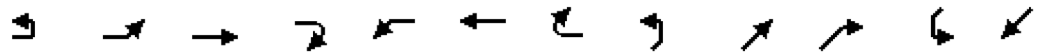


| Lane Group | SWL | SWT | SWR |
|------------------------|------|------|-----|
| Starvation Cap Reductn | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | |
| Reduced v/c Ratio | 0.54 | 0.95 | |
| Intersection Summary | | | |

TIP Before and After Evaluations - Somerville - Broadway AM

6: Broadway & Garfield Avenue

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NEL | NET | NER | SWL | SWT |
|----------------------------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↔ | ↕↕ | | | ↕↕ | | | ↕↕ | | | ↕↕ |
| Traffic Volume (vph) | 22 | 19 | 335 | 0 | 0 | 390 | 34 | 6 | 3 | 1 | 118 | 0 |
| Future Volume (vph) | 22 | 19 | 335 | 0 | 0 | 390 | 34 | 6 | 3 | 1 | 118 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 75 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Lanes | | 1 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Taper Length (ft) | | 25 | | | 25 | | | 100 | | | 25 | |
| Lane Util. Factor | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | 0.988 | | | 0.986 | | | |
| Flt Protected | | 0.950 | | | | | | | 0.971 | | | 0.950 |
| Satd. Flow (prot) | 0 | 1719 | 3438 | 0 | 0 | 3397 | 0 | 0 | 1732 | 0 | 0 | 1719 |
| Flt Permitted | | 0.475 | | | | | | | 0.912 | | | 0.726 |
| Satd. Flow (perm) | 0 | 860 | 3438 | 0 | 0 | 3397 | 0 | 0 | 1627 | 0 | 0 | 1314 |
| Right Turn on Red | | | | Yes | | | Yes | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | 14 | | | 1 | | | |
| Link Speed (mph) | | | 25 | | | 25 | | | 25 | | | 25 |
| Link Distance (ft) | | | 417 | | | 245 | | | 427 | | | 511 |
| Travel Time (s) | | | 11.4 | | | 6.7 | | | 11.6 | | | 13.9 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.97 | 0.97 | 0.92 | 0.92 | 0.97 | 0.97 | 0.97 | 0.92 | 0.97 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% |
| Adj. Flow (vph) | 24 | 21 | 364 | 0 | 0 | 424 | 37 | 6 | 3 | 1 | 128 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 45 | 364 | 0 | 0 | 461 | 0 | 0 | 10 | 0 | 0 | 128 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left |
| Median Width(ft) | | | 20 | | | 20 | | | 0 | | | 0 |
| Link Offset(ft) | | | 0 | | | 0 | | | 0 | | | 0 |
| Crosswalk Width(ft) | | | 16 | | | 16 | | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 | | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Left | Thru | | | Thru | | Left | Thru | | Left | Thru |
| Leading Detector (ft) | 20 | 20 | 100 | | | 100 | | 20 | 100 | | 20 | 100 |
| Trailing Detector (ft) | 0 | 0 | 0 | | | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | | | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Size(ft) | 20 | 20 | 6 | | | 6 | | 20 | 6 | | 20 | 6 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(ft) | | | 94 | | | 94 | | | 94 | | | 94 |
| Detector 2 Size(ft) | | | 6 | | | 6 | | | 6 | | | 6 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 |
| Turn Type | Perm | Perm | NA | | | NA | | Perm | NA | | Prot | NA |
| Protected Phases | | | 2 | | | 6 | | | 4 | | 3 | 8 |

TIP Before and After Evaluations - Somerville - Broadway AM
 6: Broadway & Garfield Avenue

12/20/2023

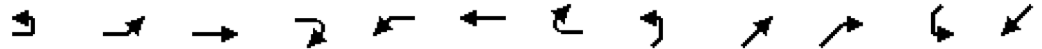


| | |
|----------------------------|-------|
| Lane Group | SWR |
| Lane Configurations | 7 |
| Traffic Volume (vph) | 35 |
| Future Volume (vph) | 35 |
| Ideal Flow (vphpl) | 1900 |
| Storage Length (ft) | 0 |
| Storage Lanes | 1 |
| Taper Length (ft) | |
| Lane Util. Factor | 1.00 |
| Frt | 0.850 |
| Flt Protected | |
| Satd. Flow (prot) | 1538 |
| Flt Permitted | |
| Satd. Flow (perm) | 1538 |
| Right Turn on Red | Yes |
| Satd. Flow (RTOR) | 38 |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | 0.92 |
| Heavy Vehicles (%) | 5% |
| Adj. Flow (vph) | 38 |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | 38 |
| Enter Blocked Intersection | No |
| Lane Alignment | Right |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | 1.00 |
| Turning Speed (mph) | 9 |
| Number of Detectors | 1 |
| Detector Template | Right |
| Leading Detector (ft) | 20 |
| Trailing Detector (ft) | 0 |
| Detector 1 Position(ft) | 0 |
| Detector 1 Size(ft) | 20 |
| Detector 1 Type | Cl+Ex |
| Detector 1 Channel | |
| Detector 1 Extend (s) | 0.0 |
| Detector 1 Queue (s) | 0.0 |
| Detector 1 Delay (s) | 0.0 |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | Perm |
| Protected Phases | |

TIP Before and After Evaluations - Somerville - Broadway AM

6: Broadway & Garfield Avenue

12/20/2023



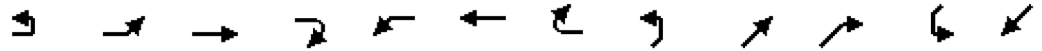
| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NEL | NET | NER | SWL | SWT |
|-------------------------|-------|-------|-------|-----|-----|-------|-----|-------|-------|-----|-------|-------|
| Permitted Phases | 2 | 2 | | | | | | 4 | | | | |
| Detector Phase | 2 | 2 | 2 | | | 6 | | 4 | 4 | | 3 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 17.0 | 17.0 | 17.0 | | | 17.0 | | 1.0 | 1.0 | | 14.0 | 14.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | | 24.0 | | 3.0 | 3.0 | | 24.0 | 24.0 |
| Total Split (s) | 77.0 | 77.0 | 77.0 | | | 77.0 | | 14.0 | 14.0 | | 25.0 | 39.0 |
| Total Split (%) | 66.4% | 66.4% | 66.4% | | | 66.4% | | 12.1% | 12.1% | | 21.6% | 33.6% |
| Maximum Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 12.0 | 12.0 | | 19.0 | 33.0 |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | | | 3.0 | | 2.0 | 2.0 | | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | | | 3.0 | | 0.0 | 0.0 | | 3.0 | 3.0 |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 |
| Total Lost Time (s) | | 6.0 | 6.0 | | | 6.0 | | | 2.0 | | | 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 | 3.0 |
| Recall Mode | C-Max | C-Max | C-Max | | | None | | None | None | | None | None |
| Walk Time (s) | 7.0 | 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) | 48 | 48 | 48 | | | 22 | | | | | 22 | 22 |
| Act Effct Green (s) | | 71.0 | 71.0 | | | 71.0 | | | 26.1 | | | 10.2 |
| Actuated g/C Ratio | | 0.61 | 0.61 | | | 0.61 | | | 0.23 | | | 0.09 |
| v/c Ratio | | 0.09 | 0.17 | | | 0.22 | | | 0.03 | | | 0.85 |
| Control Delay (s/veh) | | 9.8 | 10.0 | | | 10.1 | | | 42.6 | | | 82.2 |
| Queue Delay | | 0.0 | 0.0 | | | 2.1 | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | 9.8 | 10.0 | | | 12.2 | | | 42.6 | | | 82.2 |
| LOS | | A | B | | | B | | | D | | | F |
| Approach Delay (s/veh) | | | 10.0 | | | 12.2 | | | 42.6 | | | 65.7 |
| Approach LOS | | | A | | | B | | | D | | | E |
| 90th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 13.0 | 13.0 | | 18.0 | 33.0 |
| 90th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Ped | Max |
| 70th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 0.0 | 0.0 | | 33.0 | 33.0 |
| 70th %ile Term Code | Coord | Coord | Coord | | | Coord | | Skip | Skip | | Hold | Max |
| 50th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 37.0 | 37.0 | | 0.0 | 33.0 |
| 50th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Skip | Max |
| 30th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 37.0 | 37.0 | | 0.0 | 33.0 |
| 30th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Skip | Max |
| 10th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 37.0 | 37.0 | | 0.0 | 33.0 |
| 10th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Skip | Max |
| Stops (vph) | | 16 | 138 | | | 173 | | | 10 | | | 61 |
| Fuel Used(gal) | | 0 | 2 | | | 2 | | | 0 | | | 3 |
| CO Emissions (g/hr) | | 20 | 168 | | | 169 | | | 11 | | | 190 |
| NOx Emissions (g/hr) | | 4 | 33 | | | 33 | | | 2 | | | 37 |
| VOC Emissions (g/hr) | | 5 | 39 | | | 39 | | | 3 | | | 44 |
| Dilemma Vehicles (#) | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| Queue Length 50th (ft) | | 13 | 57 | | | 73 | | | 5 | | | ~199 |
| Queue Length 95th (ft) | | 29 | 80 | | | 99 | | | 23 | | | 152 |
| Internal Link Dist (ft) | | | 337 | | | 165 | | | 347 | | | 431 |
| Turn Bay Length (ft) | | 75 | | | | | | | | | | |
| Base Capacity (vph) | | 526 | 2104 | | | 2084 | | | 382 | | | 151 |

TIP Before and After Evaluations - Somerville - Broadway AM
 6: Broadway & Garfield Avenue

12/20/2023



| Lane Group | SWR |
|-------------------------|-------|
| Permitted Phases | 8 |
| Detector Phase | 8 |
| Switch Phase | |
| Minimum Initial (s) | 14.0 |
| Minimum Split (s) | 24.0 |
| Total Split (s) | 39.0 |
| Total Split (%) | 33.6% |
| Maximum Green (s) | 33.0 |
| Yellow Time (s) | 3.0 |
| All-Red Time (s) | 3.0 |
| Lost Time Adjust (s) | 0.0 |
| Total Lost Time (s) | 6.0 |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Walk Time (s) | 7.0 |
| Flash Dont Walk (s) | 11.0 |
| Pedestrian Calls (#/hr) | 22 |
| Act Effct Green (s) | 33.0 |
| Actuated g/C Ratio | 0.28 |
| v/c Ratio | 0.08 |
| Control Delay (s/veh) | 10.0 |
| Queue Delay | 0.0 |
| Total Delay (s/veh) | 10.0 |
| LOS | A |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 33.0 |
| 90th %ile Term Code | Max |
| 70th %ile Green (s) | 33.0 |
| 70th %ile Term Code | Max |
| 50th %ile Green (s) | 33.0 |
| 50th %ile Term Code | Max |
| 30th %ile Green (s) | 33.0 |
| 30th %ile Term Code | Max |
| 10th %ile Green (s) | 33.0 |
| 10th %ile Term Code | Max |
| Stops (vph) | 8 |
| Fuel Used(gal) | 0 |
| CO Emissions (g/hr) | 18 |
| NOx Emissions (g/hr) | 3 |
| VOC Emissions (g/hr) | 4 |
| Dilemma Vehicles (#) | 0 |
| Queue Length 50th (ft) | 0 |
| Queue Length 95th (ft) | 26 |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | 464 |



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NEL | NET | NER | SWL | SWT |
|------------------------|-----|------|------|-----|-----|------|-----|-----|------|-----|-----|------|
| Starvation Cap Reductn | | 0 | 0 | | | 1449 | | | 0 | | | 0 |
| Spillback Cap Reductn | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| Storage Cap Reductn | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| Reduced v/c Ratio | | 0.09 | 0.17 | | | 0.73 | | | 0.03 | | | 0.85 |

Intersection Summary

| | |
|---|--|
| Area Type: | Other |
| Cycle Length: | 116 |
| Actuated Cycle Length: | 116 |
| Offset: | 0 (0%), Referenced to phase 2:EBTL, Start of Green |
| Natural Cycle: | 55 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.85 |
| Intersection Signal Delay (s/veh): | 20.1 |
| Intersection LOS: | C |
| Intersection Capacity Utilization: | 61.7% |
| ICU Level of Service: | B |
| Analysis Period (min): | 15 |
| ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. | |

Splits and Phases: 6: Broadway & Garfield Avenue



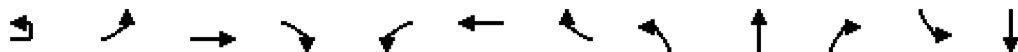


| Lane Group | SWR |
|------------------------|------|
| Starvation Cap Reductn | 0 |
| Spillback Cap Reductn | 0 |
| Storage Cap Reductn | 0 |
| Reduced v/c Ratio | 0.08 |
| Intersection Summary | |

TIP Before and After Evaluations - Somerville - Broadway AM

8: Cross Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 8 | 9 | 310 | 133 | 44 | 290 | 2 | 118 | 5 | 34 | 1 | 1 |
| Future Volume (vph) | 8 | 9 | 310 | 133 | 44 | 290 | 2 | 118 | 5 | 34 | 1 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 100 | | 0 | 100 | | 100 | 0 | | 50 | 0 | |
| Storage Lanes | | 1 | | 0 | 1 | | 1 | 1 | | 0 | 0 | |
| Taper Length (ft) | | 25 | | | 25 | | | 25 | | | 25 | |
| Lane Util. Factor | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.955 | | | 0.999 | | | 0.933 | | | 0.895 |
| Flt Protected | | 0.950 | | 0.950 | | | | 0.950 | 0.976 | | | 0.994 |
| Satd. Flow (prot) | 0 | 1719 | 3283 | 0 | 1719 | 3435 | 0 | 1633 | 1565 | 0 | 0 | 1610 |
| Flt Permitted | | 0.560 | | 0.458 | | | | 0.950 | 0.926 | | | 0.965 |
| Satd. Flow (perm) | 0 | 1013 | 3283 | 0 | 829 | 3435 | 0 | 1633 | 1485 | 0 | 0 | 1563 |
| Right Turn on Red | | | | No | | | No | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | | | | 25 | | | |
| Link Speed (mph) | | | 25 | | | 25 | | | 20 | | | 20 |
| Link Distance (ft) | | | 245 | | | 558 | | | 506 | | | 391 |
| Travel Time (s) | | | 6.7 | | | 15.2 | | | 17.3 | | | 13.3 |
| 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 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% |
| Adj. Flow (vph) | 9 | 10 | 337 | 145 | 48 | 315 | 2 | 128 | 5 | 37 | 1 | 1 |
| Shared Lane Traffic (%) | | | | | | | | 32% | | | | |
| Lane Group Flow (vph) | 0 | 19 | 482 | 0 | 48 | 317 | 0 | 87 | 83 | 0 | 0 | 9 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left |
| Median Width(ft) | | | 15 | | | 12 | | | 12 | | | 12 |
| Link Offset(ft) | | | 0 | | | 0 | | | 0 | | | 0 |
| Crosswalk Width(ft) | | | 16 | | | 16 | | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru |
| Leading Detector (ft) | 20 | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 |
| Trailing Detector (ft) | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Size(ft) | 20 | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(ft) | | | 94 | | | 94 | | | 94 | | | 94 |
| Detector 2 Size(ft) | | | 6 | | | 6 | | | 6 | | | 6 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 |
| Turn Type | Perm | Perm | NA | | Perm | NA | | Prot | NA | | Perm | NA |
| Protected Phases | | | 2 | | | 6 | | 3 | 8 | | | 4 |

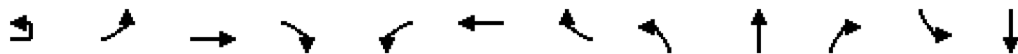


| Lane Group | SBR | Ø9 |
|----------------------------|-------|----|
| Lane Configurations | | |
| Traffic Volume (vph) | 6 | |
| Future Volume (vph) | 6 | |
| Ideal Flow (vphpl) | 1900 | |
| Storage Length (ft) | 0 | |
| Storage Lanes | 0 | |
| Taper Length (ft) | | |
| Lane Util. Factor | 1.00 | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | 0 | |
| Flt Permitted | | |
| Satd. Flow (perm) | 0 | |
| Right Turn on Red | No | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | 0.92 | |
| Heavy Vehicles (%) | 5% | |
| Adj. Flow (vph) | 7 | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | 0 | |
| Enter Blocked Intersection | No | |
| Lane Alignment | Right | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | 1.00 | |
| Turning Speed (mph) | 9 | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | | 9 |

TIP Before and After Evaluations - Somerville - Broadway AM

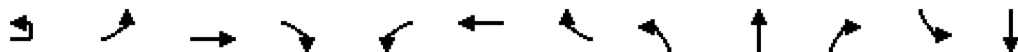
8: Cross Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-------------------------|-------|-------|-------|-----|-------|-------|-----|------|-------|-----|-------|-------|
| Permitted Phases | 2 | 2 | | | 6 | | | | | | 4 | |
| Detector Phase | 2 | 2 | 2 | | 6 | 6 | | 3 | 8 | | 4 | 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 34.0 | 34.0 | 34.0 | | 39.0 | 39.0 | | 5.0 | 27.0 | | 27.0 | 27.0 |
| Minimum Split (s) | 53.0 | 53.0 | 53.0 | | 45.0 | 45.0 | | 9.5 | 33.0 | | 33.0 | 33.0 |
| Total Split (s) | 53.0 | 53.0 | 53.0 | | 53.0 | 53.0 | | 10.0 | 43.0 | | 33.0 | 33.0 |
| Total Split (%) | 44.2% | 44.2% | 44.2% | | 44.2% | 44.2% | | 8.3% | 35.8% | | 27.5% | 27.5% |
| Maximum Green (s) | 47.0 | 47.0 | 47.0 | | 47.0 | 47.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.5 | 3.0 | | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 1.0 | 3.0 | | 3.0 | 3.0 |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | | | Lead | | | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | 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 | C-Max | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 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 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 34 | 34 | 34 | | 35 | 35 | | | 24 | | 11 | 11 |
| Act Effct Green (s) | | 71.0 | 71.0 | | 71.0 | 71.0 | | 25.3 | 23.8 | | | 27.0 |
| Actuated g/C Ratio | | 0.59 | 0.59 | | 0.59 | 0.59 | | 0.21 | 0.20 | | | 0.23 |
| v/c Ratio | | 0.03 | 0.25 | | 0.10 | 0.16 | | 0.25 | 0.25 | | | 0.03 |
| Control Delay (s/veh) | | 10.5 | 12.1 | | 14.8 | 16.0 | | 48.7 | 37.5 | | | 36.8 |
| Queue Delay | | 0.0 | 2.9 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | 10.5 | 15.0 | | 14.8 | 16.0 | | 48.7 | 37.5 | | | 36.8 |
| LOS | | B | B | | B | B | | D | D | | | D |
| Approach Delay (s/veh) | | | 14.9 | | | 15.8 | | | 43.3 | | | 36.8 |
| Approach LOS | | | B | | | B | | | D | | | D |
| 90th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| 90th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Max | Max | | Max | Max |
| 70th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| 70th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Max | Max | | Max | Max |
| 50th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 38.5 | 37.0 | | 0.0 | 0.0 |
| 50th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Hold | Max | | Skip | Skip |
| 30th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 38.5 | 37.0 | | 0.0 | 0.0 |
| 30th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Hold | Max | | Skip | Skip |
| 10th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 38.5 | 37.0 | | 0.0 | 0.0 |
| 10th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Hold | Max | | Skip | Skip |
| Stops (vph) | | 7 | 201 | | 28 | 212 | | 48 | 29 | | | 8 |
| Fuel Used(gal) | | 0 | 3 | | 0 | 3 | | 1 | 1 | | | 0 |
| CO Emissions (g/hr) | | 7 | 195 | | 31 | 220 | | 90 | 71 | | | 8 |
| NOx Emissions (g/hr) | | 1 | 38 | | 6 | 43 | | 18 | 14 | | | 1 |
| VOC Emissions (g/hr) | | 2 | 45 | | 7 | 51 | | 21 | 16 | | | 2 |
| Dilemma Vehicles (#) | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | 0 |
| Queue Length 50th (ft) | | 6 | 88 | | 25 | 91 | | 50 | 33 | | | 5 |
| Queue Length 95th (ft) | | 16 | 118 | | m46 | 116 | | #197 | #169 | | | 20 |
| Internal Link Dist (ft) | | | 165 | | | 478 | | | 426 | | | 311 |
| Turn Bay Length (ft) | | 100 | | | 100 | | | | | | | |
| Base Capacity (vph) | | 599 | 1942 | | 490 | 2032 | | 343 | 330 | | | 351 |

| Lane Group | SBR | Ø9 |
|-------------------------|-----|------|
| Permitted Phases | | |
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | | 18.0 |
| Minimum Split (s) | | 24.0 |
| Total Split (s) | | 24.0 |
| Total Split (%) | | 20% |
| Maximum Green (s) | | 18.0 |
| Yellow Time (s) | | 3.0 |
| All-Red Time (s) | | 3.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | | |
| Lead-Lag Optimize? | | |
| Vehicle Extension (s) | | 3.0 |
| Recall Mode | | None |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay (s/veh) | | |
| Queue Delay | | |
| Total Delay (s/veh) | | |
| LOS | | |
| Approach Delay (s/veh) | | |
| Approach LOS | | |
| 90th %ile Green (s) | | 0.0 |
| 90th %ile Term Code | | Skip |
| 70th %ile Green (s) | | 0.0 |
| 70th %ile Term Code | | Skip |
| 50th %ile Green (s) | | 0.0 |
| 50th %ile Term Code | | Skip |
| 30th %ile Green (s) | | 0.0 |
| 30th %ile Term Code | | Skip |
| 10th %ile Green (s) | | 0.0 |
| 10th %ile Term Code | | Skip |
| Stops (vph) | | |
| Fuel Used(gal) | | |
| CO Emissions (g/hr) | | |
| NOx Emissions (g/hr) | | |
| VOC Emissions (g/hr) | | |
| Dilemma Vehicles (#) | | |
| Queue Length 50th (ft) | | |
| Queue Length 95th (ft) | | |
| Internal Link Dist (ft) | | |
| Turn Bay Length (ft) | | |
| Base Capacity (vph) | | |



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|------------------------|-----|------|------|-----|------|------|-----|------|------|-----|-----|------|
| Starvation Cap Reductn | | 0 | 1324 | | 0 | 0 | | 0 | 0 | | | 0 |
| Spillback Cap Reductn | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | 0 |
| Storage Cap Reductn | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | 0 |
| Reduced v/c Ratio | | 0.03 | 0.78 | | 0.10 | 0.16 | | 0.25 | 0.25 | | | 0.03 |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 120 |
| Actuated Cycle Length: | 120 |
| Offset: | 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green |
| Natural Cycle: | 120 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.25 |
| Intersection Signal Delay (s/veh): | 20.0 |
| Intersection LOS: | C |
| Intersection Capacity Utilization: | 69.1% |
| 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. |
| m | Volume for 95th percentile queue is metered by upstream signal. |

Splits and Phases: 8: Cross Street



8: Cross Street



| | | |
|------------------------|-----|----|
| Lane Group | SBR | Ø9 |
| Starvation Cap Reductn | | |
| Spillback Cap Reductn | | |
| Storage Cap Reductn | | |
| Reduced v/c Ratio | | |
| Intersection Summary | | |

TIP Before and After Evaluations - Somerville - Broadway AM

11: Glen St/Michigan Ave

12/20/2023



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|-------|-------|-------|-------|-------|------|------|-------|------|------|-------|
| Lane Configurations | | ↑ | ↗ | ↖ | ↗ | ↖ | | | | | | |
| Traffic Volume (vph) | 11 | 201 | 150 | 113 | 308 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Future Volume (vph) | 11 | 201 | 150 | 113 | 308 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 50 | 75 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | 0.998 | | | | | | | |
| Flt Protected | | 0.997 | | 0.950 | | | | | | | | |
| Satd. Flow (prot) | 0 | 1787 | 1524 | 1703 | 1789 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flt Permitted | | 0.997 | | 0.950 | | | | | | | | |
| Satd. Flow (perm) | 0 | 1787 | 1524 | 1703 | 1789 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Link Speed (mph) | | 25 | | | 25 | | | 20 | | | | 20 |
| Link Distance (ft) | | 558 | | | 527 | | | 639 | | | | 396 |
| Travel Time (s) | | 15.2 | | | 14.4 | | | 21.8 | | | | 13.5 |
| 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 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Adj. Flow (vph) | 12 | 218 | 163 | 123 | 335 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 230 | 163 | 123 | 340 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Free | | | Free | | | Stop | | | | Stop |

Intersection Summary

| | |
|-----------------------------------|--------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 34.4% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

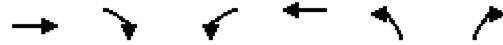
TIP Before and After Evaluations - Somerville - Broadway AM
 14: Franklin Street & Broadway

12/20/2023

| | → | ↘ | ↙ | ← | ↖ | ↗ | |
|----------------------------|-------|-------|------|-------|-------|-------|----|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | Ø9 |
| Lane Configurations | ↑ | | | ↑ | ↘↙ | | |
| Traffic Volume (vph) | 216 | 0 | 0 | 238 | 119 | 54 | |
| Future Volume (vph) | 216 | 0 | 0 | 238 | 119 | 54 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Fr _t | | | | | 0.958 | | |
| Fl _t Protected | | | | | 0.967 | | |
| Satd. Flow (prot) | 1792 | 0 | 0 | 1792 | 1661 | 0 | |
| Fl _t Permitted | | | | | 0.967 | | |
| Satd. Flow (perm) | 1792 | 0 | 0 | 1792 | 1661 | 0 | |
| Right Turn on Red | | Yes | | | | Yes | |
| Satd. Flow (RTOR) | | | | | 17 | | |
| Link Speed (mph) | 25 | | | 25 | 25 | | |
| Link Distance (ft) | 527 | | | 1045 | 888 | | |
| Travel Time (s) | 14.4 | | | 28.5 | 24.2 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | |
| Adj. Flow (vph) | 235 | 0 | 0 | 259 | 129 | 59 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 235 | 0 | 0 | 259 | 188 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | |
| Median Width(ft) | 17 | | | 17 | 12 | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 | |
| Number of Detectors | 2 | | | 2 | 1 | | |
| Detector Template | Thru | | | Thru | Left | | |
| Leading Detector (ft) | 100 | | | 100 | 20 | | |
| Trailing Detector (ft) | 0 | | | 0 | 0 | | |
| Detector 1 Position(ft) | 0 | | | 0 | 0 | | |
| Detector 1 Size(ft) | 6 | | | 6 | 20 | | |
| Detector 1 Type | Cl+Ex | | | Cl+Ex | Cl+Ex | | |
| Detector 1 Channel | | | | | | | |
| Detector 1 Extend (s) | 0.0 | | | 0.0 | 0.0 | | |
| Detector 1 Queue (s) | 0.0 | | | 0.0 | 0.0 | | |
| Detector 1 Delay (s) | 0.0 | | | 0.0 | 0.0 | | |
| Detector 2 Position(ft) | 94 | | | 94 | | | |
| Detector 2 Size(ft) | 6 | | | 6 | | | |
| Detector 2 Type | Cl+Ex | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | | |
| Turn Type | NA | | | NA | Prot | | |
| Protected Phases | 2 | | | 6 | 4 | 9 | |
| Permitted Phases | | | | | | | |
| Detector Phase | 2 | | | 6 | 4 | | |
| Switch Phase | | | | | | | |

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 14: Franklin Street & Broadway

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| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | Ø9 |
|-------------------------|-------|-----|-----|-------|-------|-----|------|
| Minimum Initial (s) | 15.0 | | | 11.0 | 7.0 | | 11.0 |
| Minimum Split (s) | 24.0 | | | 24.0 | 24.0 | | 17.0 |
| Total Split (s) | 37.0 | | | 37.0 | 29.0 | | 17.0 |
| Total Split (%) | 30.8% | | | 30.8% | 24.2% | | 14% |
| Maximum Green (s) | 31.0 | | | 31.0 | 23.0 | | 11.0 |
| Yellow Time (s) | 3.0 | | | 3.0 | 3.0 | | 3.0 |
| All-Red Time (s) | 3.0 | | | 3.0 | 3.0 | | 3.0 |
| Lost Time Adjust (s) | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | | | 6.0 | 6.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | | | 3.0 | 3.0 | | 3.0 |
| Recall Mode | C-Max | | | None | None | | None |
| Walk Time (s) | 7.0 | | | 7.0 | 7.0 | | |
| Flash Dont Walk (s) | 11.0 | | | 11.0 | 11.0 | | |
| Pedestrian Calls (#/hr) | 51 | | | 6 | 51 | | |
| Act Effct Green (s) | 61.2 | | | 22.5 | 18.3 | | |
| Actuated g/C Ratio | 0.51 | | | 0.19 | 0.15 | | |
| v/c Ratio | 0.26 | | | 0.77 | 0.70 | | |
| Control Delay (s/veh) | 17.1 | | | 61.1 | 57.6 | | |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | | |
| Total Delay (s/veh) | 17.1 | | | 61.1 | 57.6 | | |
| LOS | B | | | E | E | | |
| Approach Delay (s/veh) | 17.1 | | | 61.1 | 57.6 | | |
| Approach LOS | B | | | E | E | | |
| 90th %ile Green (s) | 48.0 | | | 29.8 | 24.2 | | 0.0 |
| 90th %ile Term Code | Coord | | | Gap | Max | | Skip |
| 70th %ile Green (s) | 55.9 | | | 25.6 | 20.5 | | 0.0 |
| 70th %ile Term Code | Coord | | | Gap | Gap | | Skip |
| 50th %ile Green (s) | 61.4 | | | 22.6 | 18.0 | | 0.0 |
| 50th %ile Term Code | Coord | | | Gap | Ped | | Skip |
| 30th %ile Green (s) | 64.4 | | | 19.6 | 18.0 | | 0.0 |
| 30th %ile Term Code | Coord | | | Gap | Ped | | Skip |
| 10th %ile Green (s) | 76.1 | | | 15.1 | 10.8 | | 0.0 |
| 10th %ile Term Code | Coord | | | Gap | Gap | | Skip |
| Stops (vph) | 93 | | | 221 | 147 | | |
| Fuel Used(gal) | 2 | | | 6 | 4 | | |
| CO Emissions (g/hr) | 145 | | | 414 | 273 | | |
| NOx Emissions (g/hr) | 28 | | | 81 | 53 | | |
| VOC Emissions (g/hr) | 34 | | | 96 | 63 | | |
| Dilemma Vehicles (#) | 0 | | | 0 | 0 | | |
| Queue Length 50th (ft) | 82 | | | 192 | 128 | | |
| Queue Length 95th (ft) | 127 | | | 267 | 197 | | |
| Internal Link Dist (ft) | 447 | | | 965 | 808 | | |
| Turn Bay Length (ft) | | | | | | | |
| Base Capacity (vph) | 913 | | | 462 | 335 | | |
| Starvation Cap Reductn | 0 | | | 0 | 0 | | |
| Spillback Cap Reductn | 0 | | | 0 | 0 | | |
| Storage Cap Reductn | 0 | | | 0 | 0 | | |

TIP Before and After Evaluations - Somerville - Broadway AM
 14: Franklin Street & Broadway

12/20/2023



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | Ø9 |
|-------------------|------|-----|-----|------|------|-----|----|
| Reduced v/c Ratio | 0.26 | | | 0.56 | 0.56 | | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 120 |
| Actuated Cycle Length: | 120 |
| Offset: | 0 (0%), Referenced to phase 2:EBT, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.77 |
| Intersection Signal Delay (s/veh): | 45.0 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 32.4% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

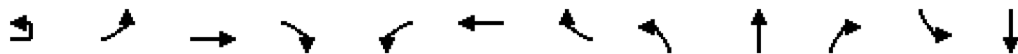
Splits and Phases: 14: Franklin Street & Broadway



TIP Before and After Evaluations - Somerville - Broadway AM

16: Broadway & Lombardi Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 1 | 67 | 167 | 0 | 0 | 0 | 0 | 38 | 92 | 22 | 281 | 0 |
| Future Volume (vph) | 1 | 67 | 167 | 0 | 0 | 0 | 0 | 38 | 92 | 22 | 281 | 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 | |
| Storage Lanes | | 1 | | 0 | 0 | | 0 | 0 | | 0 | 1 | |
| 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 | | | | | | | | | 0.980 | | | |
| Flt Protected | | 0.950 | | | | | | | 0.988 | | 0.950 | |
| Satd. Flow (prot) | 0 | 1719 | 1810 | 0 | 0 | 0 | 0 | 0 | 1752 | 0 | 1719 | 0 |
| Flt Permitted | | 0.950 | | | | | | | 0.988 | | 0.705 | |
| Satd. Flow (perm) | 0 | 1719 | 1810 | 0 | 0 | 0 | 0 | 0 | 1752 | 0 | 1276 | 0 |
| Right Turn on Red | | | | Yes | | | Yes | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | | | | 14 | | | |
| Link Speed (mph) | | | 25 | | | 25 | | | 25 | | | 25 |
| Link Distance (ft) | | | 1045 | | | 535 | | | 692 | | | 390 |
| Travel Time (s) | | | 28.5 | | | 14.6 | | | 18.9 | | | 10.6 |
| 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 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% |
| Adj. Flow (vph) | 1 | 73 | 182 | 0 | 0 | 0 | 0 | 41 | 100 | 24 | 305 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 74 | 182 | 0 | 0 | 0 | 0 | 0 | 165 | 0 | 305 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left |
| Median Width(ft) | | | 15 | | | 15 | | | 20 | | | 20 |
| Link Offset(ft) | | | 0 | | | 0 | | | 0 | | | 0 |
| Crosswalk Width(ft) | | | 16 | | | 16 | | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | |
| Number of Detectors | 1 | 1 | 2 | | | | | 1 | 2 | | 1 | |
| Detector Template | Left | Left | Thru | | | | | Left | Thru | | Left | |
| Leading Detector (ft) | 20 | 20 | 100 | | | | | 20 | 100 | | 20 | |
| Trailing Detector (ft) | 0 | 0 | 0 | | | | | 0 | 0 | | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | | | | | 0 | 0 | | 0 | |
| Detector 1 Size(ft) | 20 | 20 | 6 | | | | | 20 | 6 | | 20 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | | | Cl+Ex | Cl+Ex | | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(ft) | | | 94 | | | | | | 94 | | | |
| Detector 2 Size(ft) | | | 6 | | | | | | 6 | | | |
| Detector 2 Type | | | Cl+Ex | | | | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | | | | 0.0 | | | |
| Turn Type | Perm | Perm | NA | | | | | Perm | NA | | Perm | |
| Protected Phases | | | 4 | | | | | | 2 | | | |

TIP Before and After Evaluations - Somerville - Broadway AM
 16: Broadway & Lombardi Street

12/20/2023

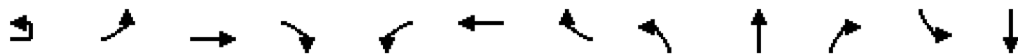


| | |
|----------------------------|-------|
| Lane Group | SBR |
| Lane Configurations | 7 |
| Traffic Volume (vph) | 266 |
| Future Volume (vph) | 266 |
| Ideal Flow (vphpl) | 1900 |
| Storage Length (ft) | 0 |
| Storage Lanes | 1 |
| Taper Length (ft) | |
| Lane Util. Factor | 1.00 |
| Frt | 0.850 |
| Flt Protected | |
| Satd. Flow (prot) | 1538 |
| Flt Permitted | |
| Satd. Flow (perm) | 1538 |
| Right Turn on Red | Yes |
| Satd. Flow (RTOR) | 289 |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | 0.92 |
| Heavy Vehicles (%) | 5% |
| Adj. Flow (vph) | 289 |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | 289 |
| Enter Blocked Intersection | No |
| Lane Alignment | Right |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | 1.00 |
| Turning Speed (mph) | 9 |
| Number of Detectors | 1 |
| Detector Template | Right |
| Leading Detector (ft) | 20 |
| Trailing Detector (ft) | 0 |
| Detector 1 Position(ft) | 0 |
| Detector 1 Size(ft) | 20 |
| Detector 1 Type | Cl+Ex |
| Detector 1 Channel | |
| Detector 1 Extend (s) | 0.0 |
| Detector 1 Queue (s) | 0.0 |
| Detector 1 Delay (s) | 0.0 |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | Perm |
| Protected Phases | |

TIP Before and After Evaluations - Somerville - Broadway AM

16: Broadway & Lombardi Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-------------------------|-------|-------|-------|-----|-----|-----|-----|-------|-------|-----|-------|------|
| Permitted Phases | 4 | 4 | | | | | | 2 | | | 6 | |
| Detector Phase | 4 | 4 | 4 | | | | | 2 | 2 | | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | 32.0 | | | | | 16.0 | 16.0 | | 24.0 | |
| Minimum Split (s) | 38.0 | 38.0 | 38.0 | | | | | 25.0 | 25.0 | | 30.0 | |
| Total Split (s) | 38.0 | 38.0 | 38.0 | | | | | 30.0 | 30.0 | | 30.0 | |
| Total Split (%) | 55.9% | 55.9% | 55.9% | | | | | 44.1% | 44.1% | | 44.1% | |
| Maximum Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | | | | | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 6.0 | 6.0 | | | | | | 6.0 | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | None | None | None | | | | | C-Max | C-Max | | C-Max | |
| Walk Time (s) | 7.0 | 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) | 2 | 2 | 2 | | | | | 83 | 83 | | 10 | |
| Act Effct Green (s) | | 32.0 | 32.0 | | | | | | 32.8 | | 32.8 | |
| Actuated g/C Ratio | | 0.47 | 0.47 | | | | | | 0.48 | | 0.48 | |
| v/c Ratio | | 0.09 | 0.21 | | | | | | 0.19 | | 0.50 | |
| Control Delay (s/veh) | | 10.4 | 11.4 | | | | | | 14.7 | | 21.4 | |
| Queue Delay | | 0.0 | 0.0 | | | | | | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 10.4 | 11.4 | | | | | | 14.7 | | 21.4 | |
| LOS | | B | B | | | | | | B | | C | |
| Approach Delay (s/veh) | | | 11.1 | | | | | | 14.7 | | | 12.7 |
| Approach LOS | | | B | | | | | | B | | | B |
| 90th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 90th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 70th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 70th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 50th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 50th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 30th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 30th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 10th %ile Green (s) | 0.0 | 0.0 | 0.0 | | | | | 62.0 | 62.0 | | 62.0 | |
| 10th %ile Term Code | Skip | Skip | Skip | | | | | Coord | Coord | | Coord | |
| Stops (vph) | | 36 | 94 | | | | | | 91 | | 213 | |
| Fuel Used(gal) | | 1 | 2 | | | | | | 2 | | 3 | |
| CO Emissions (g/hr) | | 62 | 156 | | | | | | 119 | | 208 | |
| NOx Emissions (g/hr) | | 12 | 30 | | | | | | 23 | | 40 | |
| VOC Emissions (g/hr) | | 14 | 36 | | | | | | 28 | | 48 | |
| Dilemma Vehicles (#) | | 0 | 0 | | | | | | 0 | | 0 | |
| Queue Length 50th (ft) | | 16 | 42 | | | | | | 44 | | 106 | |
| Queue Length 95th (ft) | | 36 | 78 | | | | | | 85 | | #200 | |
| Internal Link Dist (ft) | | | 965 | | | 455 | | | 612 | | | 310 |
| Turn Bay Length (ft) | | 150 | | | | | | | | | | |
| Base Capacity (vph) | | 808 | 851 | | | | | | 852 | | 615 | |

TIP Before and After Evaluations - Somerville - Broadway AM
 16: Broadway & Lombardi Street

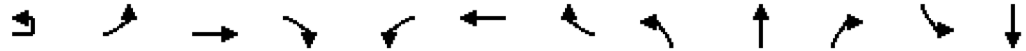
12/20/2023

| Lane Group | SBR |
|-------------------------|-------|
| Permitted Phases | 6 |
| Detector Phase | 6 |
| Switch Phase | |
| Minimum Initial (s) | 24.0 |
| Minimum Split (s) | 30.0 |
| Total Split (s) | 30.0 |
| Total Split (%) | 44.1% |
| Maximum Green (s) | 24.0 |
| Yellow Time (s) | 3.0 |
| All-Red Time (s) | 3.0 |
| Lost Time Adjust (s) | 0.0 |
| Total Lost Time (s) | 6.0 |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | C-Max |
| Walk Time (s) | 7.0 |
| Flash Dont Walk (s) | 11.0 |
| Pedestrian Calls (#/hr) | 10 |
| Act Effct Green (s) | 32.8 |
| Actuated g/C Ratio | 0.48 |
| v/c Ratio | 0.32 |
| Control Delay (s/veh) | 3.4 |
| Queue Delay | 0.0 |
| Total Delay (s/veh) | 3.4 |
| LOS | A |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 24.0 |
| 90th %ile Term Code | Coord |
| 70th %ile Green (s) | 24.0 |
| 70th %ile Term Code | Coord |
| 50th %ile Green (s) | 24.0 |
| 50th %ile Term Code | Coord |
| 30th %ile Green (s) | 24.0 |
| 30th %ile Term Code | Coord |
| 10th %ile Green (s) | 62.0 |
| 10th %ile Term Code | Coord |
| Stops (vph) | 30 |
| Fuel Used(gal) | 1 |
| CO Emissions (g/hr) | 83 |
| NOx Emissions (g/hr) | 16 |
| VOC Emissions (g/hr) | 19 |
| Dilemma Vehicles (#) | 0 |
| Queue Length 50th (ft) | 0 |
| Queue Length 95th (ft) | 45 |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | 891 |

TIP Before and After Evaluations - Somerville - Broadway AM

16: Broadway & Lombardi Street

12/20/2023

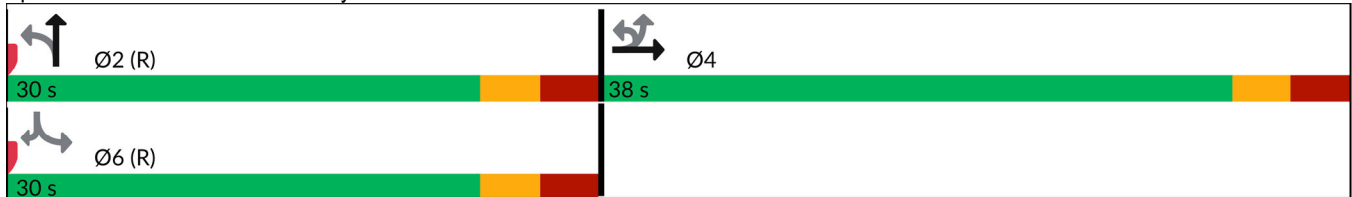


| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|------------------------|-----|------|------|-----|-----|-----|-----|-----|------|-----|------|-----|
| Starvation Cap Reductn | | 0 | 0 | | | | | | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | | | | | | 0 | | 0 | |
| Storage Cap Reductn | | 0 | 0 | | | | | | 0 | | 0 | |
| Reduced v/c Ratio | | 0.09 | 0.21 | | | | | | 0.19 | | 0.50 | |

Intersection Summary

| | |
|---|--|
| Area Type: | Other |
| Cycle Length: | 68 |
| Actuated Cycle Length: | 68 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBL, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.50 |
| Intersection Signal Delay (s/veh): | 12.6 |
| Intersection LOS: | B |
| 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: 16: Broadway & Lombardi Street



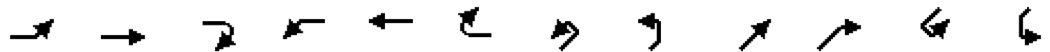


| Lane Group | SBR |
|------------------------|------|
| Starvation Cap Reductn | 0 |
| Spillback Cap Reductn | 0 |
| Storage Cap Reductn | 0 |
| Reduced v/c Ratio | 0.32 |
| Intersection Summary | |

TIP Before and After Evaluations - Somerville - Broadway PM

3: McGrath Highway & Broadway

12/20/2023



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NEU | NEL | NET | NER | SWU | SWL |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 384 | 230 | 175 | 111 | 212 | 134 | 4 | 169 | 1428 | 53 | 32 | 96 |
| Future Volume (vph) | 384 | 230 | 175 | 111 | 212 | 134 | 4 | 169 | 1428 | 53 | 32 | 96 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 250 | | 200 | 175 | | 0 | | 300 | | 0 | | 250 |
| Storage Lanes | 1 | | 1 | 1 | | 1 | | 1 | | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | | 25 | | | | 100 |
| Lane Util. Factor | 0.86 | 0.86 | 1.00 | 0.91 | 0.91 | 1.00 | 0.91 | 1.00 | 0.91 | 0.91 | 0.91 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.995 | | | |
| Flt Protected | 0.950 | 0.978 | | 0.950 | 0.998 | | | 0.950 | | | | 0.950 |
| Satd. Flow (prot) | 1507 | 4655 | 1568 | 1595 | 3351 | 1568 | 0 | 1752 | 5011 | 0 | 0 | 1752 |
| Flt Permitted | 0.950 | 0.978 | | 0.950 | 0.998 | | | 0.950 | | | | 0.950 |
| Satd. Flow (perm) | 1507 | 4655 | 1568 | 1595 | 3351 | 1568 | 0 | 1752 | 5011 | 0 | 0 | 1752 |
| Right Turn on Red | | | No | | | Yes | | | | No | | |
| Satd. Flow (RTOR) | | | | | | 215 | | | | | | |
| Link Speed (mph) | | 25 | | | 25 | | | | 25 | | | |
| Link Distance (ft) | | 770 | | | 417 | | | | 1300 | | | |
| Travel Time (s) | | 21.0 | | | 11.4 | | | | 35.5 | | | |
| 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 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| Adj. Flow (vph) | 417 | 250 | 190 | 121 | 230 | 146 | 4 | 184 | 1552 | 58 | 35 | 104 |
| Shared Lane Traffic (%) | 50% | | | 10% | | | | | | | | |
| Lane Group Flow (vph) | 208 | 459 | 190 | 109 | 242 | 146 | 0 | 188 | 1610 | 0 | 0 | 139 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | R NA | Left | Left | Right | R NA | Left |
| Median Width(ft) | | 12 | | | 12 | | | | 12 | | | |
| Link Offset(ft) | | 0 | | | 0 | | | | 0 | | | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | | 16 | | | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 9 | 15 | | 9 | 9 | 15 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | | 1 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Left | Thru | | Left | Left |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 20 | 100 | | 20 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 20 | 100 | | 20 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | | | | | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | | | | | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | | | | | |
| Turn Type | Split | NA | Perm | Split | NA | Free | Prot | Prot | NA | | Prot | Prot |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 5 | 2 | | 1 | 1 |

TIP Before and After Evaluations - Somerville - Broadway PM
 3: McGrath Highway & Broadway

12/20/2023



| Lane Group | SWT | SWR |
|----------------------------|-------|-------|
| Lane Configurations | ↑↑↑ | |
| Traffic Volume (vph) | 1173 | 122 |
| Future Volume (vph) | 1173 | 122 |
| Ideal Flow (vphpl) | 1900 | 1900 |
| Storage Length (ft) | | 0 |
| Storage Lanes | | 0 |
| Taper Length (ft) | | |
| Lane Util. Factor | 0.91 | 0.91 |
| Frt | 0.986 | |
| Flt Protected | | |
| Satd. Flow (prot) | 4965 | 0 |
| Flt Permitted | | |
| Satd. Flow (perm) | 4965 | 0 |
| Right Turn on Red | | No |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | 25 | |
| Link Distance (ft) | 1141 | |
| Travel Time (s) | 31.1 | |
| Peak Hour Factor | 0.92 | 0.92 |
| Heavy Vehicles (%) | 3% | 3% |
| Adj. Flow (vph) | 1275 | 133 |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | 1408 | 0 |
| Enter Blocked Intersection | No | No |
| Lane Alignment | Left | Right |
| Median Width(ft) | 12 | |
| Link Offset(ft) | 0 | |
| Crosswalk Width(ft) | 16 | |
| Two way Left Turn Lane | | |
| Headway Factor | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 |
| Number of Detectors | 2 | |
| Detector Template | Thru | |
| Leading Detector (ft) | 100 | |
| Trailing Detector (ft) | 0 | |
| Detector 1 Position(ft) | 0 | |
| Detector 1 Size(ft) | 6 | |
| Detector 1 Type | Cl+Ex | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | 0.0 | |
| Detector 1 Queue (s) | 0.0 | |
| Detector 1 Delay (s) | 0.0 | |
| Detector 2 Position(ft) | 94 | |
| Detector 2 Size(ft) | 6 | |
| Detector 2 Type | Cl+Ex | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | 0.0 | |
| Turn Type | NA | |
| Protected Phases | 6 | |

TIP Before and After Evaluations - Somerville - Broadway PM
 3: McGrath Highway & Broadway

12/20/2023



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NEU | NEL | NET | NER | SWU | SWL |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|-------|
| Permitted Phases | | | 4 | | | Free | | | | | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 5 | 2 | | 1 | 1 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 6.0 | 10.0 | | 6.0 | 6.0 |
| Minimum Split (s) | 38.5 | 38.5 | 38.5 | 36.5 | 36.5 | | 12.5 | 12.5 | 32.5 | | 12.5 | 12.5 |
| Total Split (s) | 38.5 | 38.5 | 38.5 | 36.5 | 36.5 | | 16.7 | 16.7 | 50.9 | | 24.1 | 24.1 |
| Total Split (%) | 25.7% | 25.7% | 25.7% | 24.3% | 24.3% | | 11.1% | 11.1% | 33.9% | | 16.1% | 16.1% |
| Maximum Green (s) | 32.0 | 32.0 | 32.0 | 30.0 | 30.0 | | 10.2 | 10.2 | 44.4 | | 17.6 | 17.6 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | | 6.5 | 6.5 | | | 6.5 |
| Lead/Lag | | | | | | | Lead | Lead | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | None | C-Max | | None | None |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | | | 7.0 | | | |
| Flash Dont Walk (s) | 25.0 | 25.0 | 25.0 | 23.0 | 23.0 | | | | 19.0 | | | |
| Pedestrian Calls (#/hr) | 8 | 8 | 8 | 7 | 7 | | | | 32 | | | |
| Act Effct Green (s) | 27.2 | 27.2 | 27.2 | 18.1 | 18.1 | 150.0 | | 26.7 | 62.6 | | | 16.1 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.12 | 0.12 | 1.00 | | 0.18 | 0.42 | | | 0.11 |
| v/c Ratio | 0.76 | 0.54 | 0.67 | 0.57 | 0.60 | 0.09 | | 0.60 | 0.77 | | | 0.74 |
| Control Delay (s/veh) | 75.8 | 57.6 | 68.3 | 72.4 | 67.9 | 0.1 | | 66.0 | 42.2 | | | 87.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | 75.8 | 57.6 | 68.3 | 72.4 | 67.9 | 0.1 | | 66.0 | 42.2 | | | 87.4 |
| LOS | E | E | E | E | E | A | | E | D | | | F |
| Approach Delay (s/veh) | | 64.4 | | | 48.9 | | | | 44.7 | | | |
| Approach LOS | | E | | | D | | | | D | | | |
| 90th %ile Green (s) | 32.0 | 32.0 | 32.0 | 30.0 | 30.0 | | 10.2 | 10.2 | 44.4 | | 17.6 | 17.6 |
| 90th %ile Term Code | Max | Max | Max | Ped | Ped | | Max | Max | Coord | | Max | Max |
| 70th %ile Green (s) | 32.0 | 32.0 | 32.0 | 18.1 | 18.1 | | 22.1 | 22.1 | 54.1 | | 19.8 | 19.8 |
| 70th %ile Term Code | Max | Max | Max | Gap | Gap | | Max | Max | Coord | | Gap | Gap |
| 50th %ile Green (s) | 29.3 | 29.3 | 29.3 | 16.2 | 16.2 | | 26.7 | 26.7 | 61.2 | | 17.3 | 17.3 |
| 50th %ile Term Code | Gap | Gap | Gap | Gap | Gap | | Max | Max | Coord | | Gap | Gap |
| 30th %ile Green (s) | 24.9 | 24.9 | 24.9 | 14.4 | 14.4 | | 32.1 | 32.1 | 69.9 | | 14.8 | 14.8 |
| 30th %ile Term Code | Gap | Gap | Gap | Gap | Gap | | Gap | Gap | Coord | | Gap | Gap |
| 10th %ile Green (s) | 17.9 | 17.9 | 17.9 | 11.8 | 11.8 | | 42.5 | 42.5 | 83.2 | | 11.1 | 11.1 |
| 10th %ile Term Code | Gap | Gap | Gap | Gap | Gap | | Max | Max | Coord | | Gap | Gap |
| Stops (vph) | 178 | 372 | 160 | 92 | 205 | 0 | | 130 | 1165 | | | 121 |
| Fuel Used(gal) | 5 | 9 | 4 | 2 | 5 | 0 | | 5 | 34 | | | 4 |
| CO Emissions (g/hr) | 341 | 639 | 293 | 153 | 326 | 33 | | 331 | 2348 | | | 279 |
| NOx Emissions (g/hr) | 66 | 124 | 57 | 30 | 63 | 7 | | 64 | 457 | | | 54 |
| VOC Emissions (g/hr) | 79 | 148 | 68 | 35 | 75 | 8 | | 77 | 544 | | | 65 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 |
| Queue Length 50th (ft) | 223 | 157 | 172 | 114 | 126 | 0 | | 172 | 500 | | | 133 |
| Queue Length 95th (ft) | 327 | 195 | 255 | 170 | 159 | 0 | | #423 | #741 | | | #220 |
| Internal Link Dist (ft) | | 690 | | | 337 | | | | 1220 | | | |
| Turn Bay Length (ft) | 250 | | 200 | 175 | | | | 300 | | | | 250 |
| Base Capacity (vph) | 321 | 993 | 334 | 319 | 670 | 1568 | | 312 | 2090 | | | 210 |

TIP Before and After Evaluations - Somerville - Broadway PM
 3: McGrath Highway & Broadway

12/20/2023



| Lane Group | SWT | SWR |
|-------------------------|-------|-----|
| Permitted Phases | | |
| Detector Phase | 6 | |
| Switch Phase | | |
| Minimum Initial (s) | 10.0 | |
| Minimum Split (s) | 38.5 | |
| Total Split (s) | 58.3 | |
| Total Split (%) | 38.9% | |
| Maximum Green (s) | 51.8 | |
| Yellow Time (s) | 3.5 | |
| All-Red Time (s) | 3.0 | |
| Lost Time Adjust (s) | 0.0 | |
| Total Lost Time (s) | 6.5 | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | |
| Recall Mode | C-Max | |
| Walk Time (s) | 7.0 | |
| Flash Dont Walk (s) | 25.0 | |
| Pedestrian Calls (#/hr) | 23 | |
| Act Effct Green (s) | 52.0 | |
| Actuated g/C Ratio | 0.35 | |
| v/c Ratio | 0.82 | |
| Control Delay (s/veh) | 49.5 | |
| Queue Delay | 0.0 | |
| Total Delay (s/veh) | 49.5 | |
| LOS | D | |
| Approach Delay (s/veh) | 52.9 | |
| Approach LOS | D | |
| 90th %ile Green (s) | 51.8 | |
| 90th %ile Term Code | Coord | |
| 70th %ile Green (s) | 51.8 | |
| 70th %ile Term Code | Coord | |
| 50th %ile Green (s) | 51.8 | |
| 50th %ile Term Code | Coord | |
| 30th %ile Green (s) | 52.6 | |
| 30th %ile Term Code | Coord | |
| 10th %ile Green (s) | 51.8 | |
| 10th %ile Term Code | Coord | |
| Stops (vph) | 1156 | |
| Fuel Used(gal) | 30 | |
| CO Emissions (g/hr) | 2103 | |
| NOx Emissions (g/hr) | 409 | |
| VOC Emissions (g/hr) | 487 | |
| Dilemma Vehicles (#) | 0 | |
| Queue Length 50th (ft) | 461 | |
| Queue Length 95th (ft) | 523 | |
| Internal Link Dist (ft) | 1061 | |
| Turn Bay Length (ft) | | |
| Base Capacity (vph) | 1719 | |

TIP Before and After Evaluations - Somerville - Broadway PM
 3: McGrath Highway & Broadway

12/20/2023

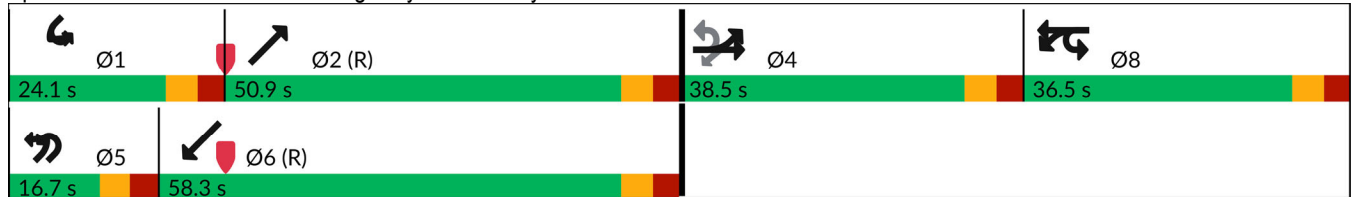


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NEU | NEL | NET | NER | SWU | SWL |
|------------------------|------|------|------|------|------|------|-----|------|------|-----|-----|------|
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | | 0 |
| Reduced v/c Ratio | 0.65 | 0.46 | 0.57 | 0.34 | 0.36 | 0.09 | | 0.60 | 0.77 | | | 0.66 |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NET and 6:SWT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay (s/veh): 51.4 Intersection LOS: D
 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: 3: McGrath Highway & Broadway



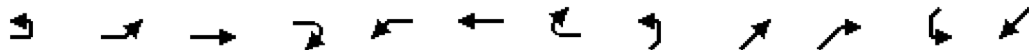


| Lane Group | SWT | SWR |
|------------------------|------|-----|
| Starvation Cap Reductn | 0 | |
| Spillback Cap Reductn | 0 | |
| Storage Cap Reductn | 0 | |
| Reduced v/c Ratio | 0.82 | |
| Intersection Summary | | |

TIP Before and After Evaluations - Somerville - Broadway PM

6: Broadway & Garfield Avenue

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NEL | NET | NER | SWL | SWT |
|----------------------------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↔ | ↕↕ | | | ↕↕ | | | ↕↕ | | | ↕↕ |
| Traffic Volume (vph) | 26 | 16 | 260 | 0 | 0 | 503 | 65 | 3 | 0 | 3 | 102 | 0 |
| Future Volume (vph) | 26 | 16 | 260 | 0 | 0 | 503 | 65 | 3 | 0 | 3 | 102 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 75 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Lanes | | 1 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Taper Length (ft) | | 25 | | | 25 | | | 100 | | | 25 | |
| Lane Util. Factor | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | 0.983 | | | 0.932 | | | |
| Flt Protected | | 0.950 | | | | | | | 0.976 | | | 0.950 |
| Satd. Flow (prot) | 0 | 1719 | 3438 | 0 | 0 | 3380 | 0 | 0 | 1646 | 0 | 0 | 1719 |
| Flt Permitted | | 0.388 | | | | | | | 0.944 | | | 0.713 |
| Satd. Flow (perm) | 0 | 702 | 3438 | 0 | 0 | 3380 | 0 | 0 | 1592 | 0 | 0 | 1290 |
| Right Turn on Red | | | | Yes | | | Yes | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | 22 | | | 85 | | | |
| Link Speed (mph) | | | 25 | | | 25 | | | 25 | | | 25 |
| Link Distance (ft) | | | 417 | | | 245 | | | 427 | | | 511 |
| Travel Time (s) | | | 11.4 | | | 6.7 | | | 11.6 | | | 13.9 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.97 | 0.97 | 0.92 | 0.92 | 0.97 | 0.97 | 0.97 | 0.92 | 0.97 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% |
| Adj. Flow (vph) | 28 | 17 | 283 | 0 | 0 | 547 | 71 | 3 | 0 | 3 | 111 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 45 | 283 | 0 | 0 | 618 | 0 | 0 | 6 | 0 | 0 | 111 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left |
| Median Width(ft) | | | 20 | | | 20 | | | 0 | | | 0 |
| Link Offset(ft) | | | 0 | | | 0 | | | 0 | | | 0 |
| Crosswalk Width(ft) | | | 16 | | | 16 | | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | |
| Number of Detectors | 1 | 1 | 2 | | | 2 | | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Left | Thru | | | Thru | | Left | Thru | | Left | Thru |
| Leading Detector (ft) | 20 | 20 | 100 | | | 100 | | 20 | 100 | | 20 | 100 |
| Trailing Detector (ft) | 0 | 0 | 0 | | | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | | | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Size(ft) | 20 | 20 | 6 | | | 6 | | 20 | 6 | | 20 | 6 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(ft) | | | 94 | | | 94 | | | 94 | | | 94 |
| Detector 2 Size(ft) | | | 6 | | | 6 | | | 6 | | | 6 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 |
| Turn Type | Perm | Perm | NA | | | NA | | Perm | NA | | Prot | NA |
| Protected Phases | | | 2 | | | 6 | | | 4 | | 3 | 8 |

TIP Before and After Evaluations - Somerville - Broadway PM
 6: Broadway & Garfield Avenue

12/20/2023

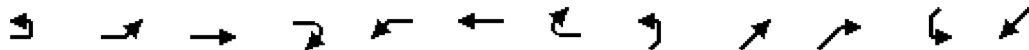


| | |
|----------------------------|-------|
| Lane Group | SWR |
| Lane Configurations | 7 |
| Traffic Volume (vph) | 41 |
| Future Volume (vph) | 41 |
| Ideal Flow (vphpl) | 1900 |
| Storage Length (ft) | 0 |
| Storage Lanes | 1 |
| Taper Length (ft) | |
| Lane Util. Factor | 1.00 |
| Frt | 0.850 |
| Flt Protected | |
| Satd. Flow (prot) | 1538 |
| Flt Permitted | |
| Satd. Flow (perm) | 1538 |
| Right Turn on Red | Yes |
| Satd. Flow (RTOR) | 45 |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | 0.92 |
| Heavy Vehicles (%) | 5% |
| Adj. Flow (vph) | 45 |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | 45 |
| Enter Blocked Intersection | No |
| Lane Alignment | Right |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | 1.00 |
| Turning Speed (mph) | 9 |
| Number of Detectors | 1 |
| Detector Template | Right |
| Leading Detector (ft) | 20 |
| Trailing Detector (ft) | 0 |
| Detector 1 Position(ft) | 0 |
| Detector 1 Size(ft) | 20 |
| Detector 1 Type | Cl+Ex |
| Detector 1 Channel | |
| Detector 1 Extend (s) | 0.0 |
| Detector 1 Queue (s) | 0.0 |
| Detector 1 Delay (s) | 0.0 |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | Perm |
| Protected Phases | |

TIP Before and After Evaluations - Somerville - Broadway PM

6: Broadway & Garfield Avenue

12/20/2023



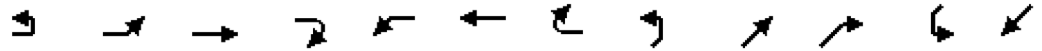
| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NEL | NET | NER | SWL | SWT |
|-------------------------|-------|-------|-------|-----|-----|-------|-----|-------|-------|-----|-------|-------|
| Permitted Phases | 2 | 2 | | | | | | 4 | | | | |
| Detector Phase | 2 | 2 | 2 | | | 6 | | 4 | 4 | | 3 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 17.0 | 17.0 | 17.0 | | | 17.0 | | 1.0 | 1.0 | | 14.0 | 14.0 |
| Minimum Split (s) | 24.0 | 24.0 | 24.0 | | | 24.0 | | 3.0 | 3.0 | | 24.0 | 24.0 |
| Total Split (s) | 77.0 | 77.0 | 77.0 | | | 77.0 | | 14.0 | 14.0 | | 25.0 | 39.0 |
| Total Split (%) | 66.4% | 66.4% | 66.4% | | | 66.4% | | 12.1% | 12.1% | | 21.6% | 33.6% |
| Maximum Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 12.0 | 12.0 | | 19.0 | 33.0 |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | | | 3.0 | | 2.0 | 2.0 | | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | | | 3.0 | | 0.0 | 0.0 | | 3.0 | 3.0 |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 |
| Total Lost Time (s) | | 6.0 | 6.0 | | | 6.0 | | | 2.0 | | | 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 | 3.0 |
| Recall Mode | C-Max | C-Max | C-Max | | | None | | None | None | | None | None |
| Walk Time (s) | 7.0 | 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) | 48 | 48 | 48 | | | 22 | | | | | 22 | 22 |
| Act Effct Green (s) | | 71.0 | 71.0 | | | 71.0 | | | 25.9 | | | 10.2 |
| Actuated g/C Ratio | | 0.61 | 0.61 | | | 0.61 | | | 0.22 | | | 0.09 |
| v/c Ratio | | 0.10 | 0.13 | | | 0.30 | | | 0.01 | | | 0.74 |
| Control Delay (s/veh) | | 10.1 | 9.7 | | | 10.7 | | | 0.0 | | | 67.3 |
| Queue Delay | | 0.0 | 0.0 | | | 4.1 | | | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | 10.1 | 9.7 | | | 14.8 | | | 0.0 | | | 67.3 |
| LOS | | B | A | | | B | | | A | | | E |
| Approach Delay (s/veh) | | | 9.8 | | | 14.8 | | | | | | 50.6 |
| Approach LOS | | | A | | | B | | | | | | D |
| 90th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 13.0 | 13.0 | | 18.0 | 33.0 |
| 90th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Ped | Max |
| 70th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 0.0 | 0.0 | | 33.0 | 33.0 |
| 70th %ile Term Code | Coord | Coord | Coord | | | Coord | | Skip | Skip | | Hold | Max |
| 50th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 37.0 | 37.0 | | 0.0 | 33.0 |
| 50th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Skip | Max |
| 30th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 37.0 | 37.0 | | 0.0 | 33.0 |
| 30th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Skip | Max |
| 10th %ile Green (s) | 71.0 | 71.0 | 71.0 | | | 71.0 | | 37.0 | 37.0 | | 0.0 | 33.0 |
| 10th %ile Term Code | Coord | Coord | Coord | | | Coord | | Hold | Hold | | Skip | Max |
| Stops (vph) | | 16 | 103 | | | 246 | | | 0 | | | 51 |
| Fuel Used(gal) | | 0 | 2 | | | 3 | | | 0 | | | 2 |
| CO Emissions (g/hr) | | 20 | 128 | | | 236 | | | 2 | | | 142 |
| NOx Emissions (g/hr) | | 4 | 25 | | | 46 | | | 0 | | | 28 |
| VOC Emissions (g/hr) | | 5 | 30 | | | 55 | | | 0 | | | 33 |
| Dilemma Vehicles (#) | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| Queue Length 50th (ft) | | 13 | 44 | | | 103 | | | 0 | | | ~173 |
| Queue Length 95th (ft) | | 30 | 63 | | | 135 | | | 0 | | | 134 |
| Internal Link Dist (ft) | | | 337 | | | 165 | | | 347 | | | 431 |
| Turn Bay Length (ft) | | 75 | | | | | | | | | | |
| Base Capacity (vph) | | 429 | 2104 | | | 2077 | | | 438 | | | 151 |

TIP Before and After Evaluations - Somerville - Broadway PM
 6: Broadway & Garfield Avenue

12/20/2023



| | |
|-------------------------|-------|
| Lane Group | SWR |
| Permitted Phases | 8 |
| Detector Phase | 8 |
| Switch Phase | |
| Minimum Initial (s) | 14.0 |
| Minimum Split (s) | 24.0 |
| Total Split (s) | 39.0 |
| Total Split (%) | 33.6% |
| Maximum Green (s) | 33.0 |
| Yellow Time (s) | 3.0 |
| All-Red Time (s) | 3.0 |
| Lost Time Adjust (s) | 0.0 |
| Total Lost Time (s) | 6.0 |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Walk Time (s) | 7.0 |
| Flash Dont Walk (s) | 11.0 |
| Pedestrian Calls (#/hr) | 22 |
| Act Effct Green (s) | 33.0 |
| Actuated g/C Ratio | 0.28 |
| v/c Ratio | 0.10 |
| Control Delay (s/veh) | 9.5 |
| Queue Delay | 0.0 |
| Total Delay (s/veh) | 9.5 |
| LOS | A |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 33.0 |
| 90th %ile Term Code | Max |
| 70th %ile Green (s) | 33.0 |
| 70th %ile Term Code | Max |
| 50th %ile Green (s) | 33.0 |
| 50th %ile Term Code | Max |
| 30th %ile Green (s) | 33.0 |
| 30th %ile Term Code | Max |
| 10th %ile Green (s) | 33.0 |
| 10th %ile Term Code | Max |
| Stops (vph) | 9 |
| Fuel Used(gal) | 0 |
| CO Emissions (g/hr) | 20 |
| NOx Emissions (g/hr) | 4 |
| VOC Emissions (g/hr) | 5 |
| Dilemma Vehicles (#) | 0 |
| Queue Length 50th (ft) | 0 |
| Queue Length 95th (ft) | 28 |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | 469 |



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NEL | NET | NER | SWL | SWT |
|------------------------|-----|------|------|-----|-----|------|-----|-----|------|-----|-----|------|
| Starvation Cap Reductn | | 0 | 0 | | | 1356 | | | 0 | | | 0 |
| Spillback Cap Reductn | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| Storage Cap Reductn | | 0 | 0 | | | 0 | | | 0 | | | 0 |
| Reduced v/c Ratio | | 0.10 | 0.13 | | | 0.86 | | | 0.01 | | | 0.74 |

Intersection Summary

Area Type: Other
 Cycle Length: 116
 Actuated Cycle Length: 116
 Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay (s/veh): 18.3 Intersection LOS: B
 Intersection Capacity Utilization 63.2% ICU Level of Service B
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Broadway & Garfield Avenue



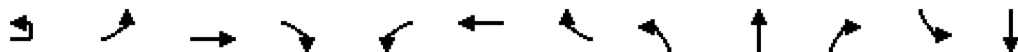


| Lane Group | SWR |
|------------------------|------|
| Starvation Cap Reductn | 0 |
| Spillback Cap Reductn | 0 |
| Storage Cap Reductn | 0 |
| Reduced v/c Ratio | 0.10 |
| Intersection Summary | |

TIP Before and After Evaluations - Somerville - Broadway PM

8: Cross Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 8 | 20 | 263 | 81 | 37 | 413 | 6 | 138 | 10 | 55 | 2 | 4 |
| Future Volume (vph) | 8 | 20 | 263 | 81 | 37 | 413 | 6 | 138 | 10 | 55 | 2 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 100 | | 0 | 100 | | 100 | 0 | | 50 | 0 | |
| Storage Lanes | | 1 | | 0 | 1 | | 1 | 1 | | 0 | 0 | |
| Taper Length (ft) | | 25 | | | 25 | | | 25 | | | 25 | |
| Lane Util. Factor | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.965 | | | 0.998 | | | 0.916 | | | 0.916 |
| Flt Protected | | 0.950 | | | 0.950 | | | 0.950 | 0.983 | | | 0.994 |
| Satd. Flow (prot) | 0 | 1719 | 3318 | 0 | 1719 | 3431 | 0 | 1633 | 1548 | 0 | 0 | 1648 |
| Flt Permitted | | 0.476 | | | 0.527 | | | 0.950 | 0.933 | | | 0.967 |
| Satd. Flow (perm) | 0 | 861 | 3318 | 0 | 954 | 3431 | 0 | 1633 | 1469 | 0 | 0 | 1603 |
| Right Turn on Red | | | | No | | | No | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | | | | 40 | | | |
| Link Speed (mph) | | | 25 | | | 25 | | | 20 | | | 20 |
| Link Distance (ft) | | | 245 | | | 558 | | | 506 | | | 391 |
| Travel Time (s) | | | 6.7 | | | 15.2 | | | 17.3 | | | 13.3 |
| 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 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% |
| Adj. Flow (vph) | 9 | 22 | 286 | 88 | 40 | 449 | 7 | 150 | 11 | 60 | 2 | 4 |
| Shared Lane Traffic (%) | | | | | | | | 24% | | | | |
| Lane Group Flow (vph) | 0 | 31 | 374 | 0 | 40 | 456 | 0 | 114 | 107 | 0 | 0 | 16 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left |
| Median Width(ft) | | | 15 | | | 12 | | | 12 | | | 12 |
| Link Offset(ft) | | | 0 | | | 0 | | | 0 | | | 0 |
| Crosswalk Width(ft) | | | 16 | | | 16 | | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | |
| Number of Detectors | 1 | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 |
| Detector Template | Left | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru |
| Leading Detector (ft) | 20 | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 |
| Trailing Detector (ft) | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 |
| Detector 1 Size(ft) | 20 | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Detector 2 Position(ft) | | | 94 | | | 94 | | | 94 | | | 94 |
| Detector 2 Size(ft) | | | 6 | | | 6 | | | 6 | | | 6 |
| Detector 2 Type | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 |
| Turn Type | Perm | Perm | NA | | Perm | NA | | Prot | NA | | Perm | NA |
| Protected Phases | | | 2 | | | 6 | | 3 | 8 | | | 4 |

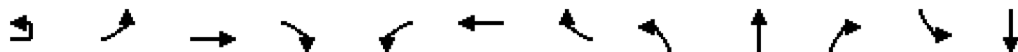


| Lane Group | SBR | Ø9 |
|----------------------------|-------|----|
| Lane Configurations | | |
| Traffic Volume (vph) | 9 | |
| Future Volume (vph) | 9 | |
| Ideal Flow (vphpl) | 1900 | |
| Storage Length (ft) | 0 | |
| Storage Lanes | 0 | |
| Taper Length (ft) | | |
| Lane Util. Factor | 1.00 | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | 0 | |
| Flt Permitted | | |
| Satd. Flow (perm) | 0 | |
| Right Turn on Red | No | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | 0.92 | |
| Heavy Vehicles (%) | 5% | |
| Adj. Flow (vph) | 10 | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | 0 | |
| Enter Blocked Intersection | No | |
| Lane Alignment | Right | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | 1.00 | |
| Turning Speed (mph) | 9 | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | | 9 |

TIP Before and After Evaluations - Somerville - Broadway PM

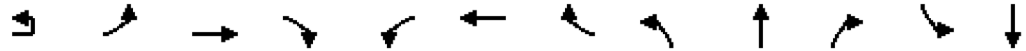
8: Cross Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-------------------------|-------|-------|-------|-----|-------|-------|-----|------|-------|-----|-------|-------|
| Permitted Phases | 2 | 2 | | | 6 | | | | | | 4 | |
| Detector Phase | 2 | 2 | 2 | | 6 | 6 | | 3 | 8 | | 4 | 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 34.0 | 34.0 | 34.0 | | 39.0 | 39.0 | | 5.0 | 27.0 | | 27.0 | 27.0 |
| Minimum Split (s) | 53.0 | 53.0 | 53.0 | | 45.0 | 45.0 | | 9.5 | 33.0 | | 33.0 | 33.0 |
| Total Split (s) | 53.0 | 53.0 | 53.0 | | 53.0 | 53.0 | | 10.0 | 43.0 | | 33.0 | 33.0 |
| Total Split (%) | 44.2% | 44.2% | 44.2% | | 44.2% | 44.2% | | 8.3% | 35.8% | | 27.5% | 27.5% |
| Maximum Green (s) | 47.0 | 47.0 | 47.0 | | 47.0 | 47.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.5 | 3.0 | | 3.0 | 3.0 |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 1.0 | 3.0 | | 3.0 | 3.0 |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 |
| Total Lost Time (s) | | 6.0 | 6.0 | | 6.0 | 6.0 | | 4.5 | 6.0 | | | 6.0 |
| Lead/Lag | | | | | | | | Lead | | | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | 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 | C-Max | C-Max | C-Max | | C-Max | C-Max | | None | None | | None | None |
| Walk Time (s) | 7.0 | 7.0 | 7.0 | | 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 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 34 | 34 | 34 | | 35 | 35 | | | 24 | | 11 | 11 |
| Act Effct Green (s) | | 71.0 | 71.0 | | 71.0 | 71.0 | | 18.7 | 17.2 | | | 27.0 |
| Actuated g/C Ratio | | 0.59 | 0.59 | | 0.59 | 0.59 | | 0.16 | 0.14 | | | 0.23 |
| v/c Ratio | | 0.06 | 0.19 | | 0.07 | 0.22 | | 0.45 | 0.42 | | | 0.04 |
| Control Delay (s/veh) | | 10.9 | 11.6 | | 14.2 | 17.9 | | 57.9 | 40.5 | | | 37.0 |
| Queue Delay | | 0.0 | 1.8 | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 |
| Total Delay (s/veh) | | 10.9 | 13.4 | | 14.2 | 17.9 | | 57.9 | 40.5 | | | 37.0 |
| LOS | | B | B | | B | B | | E | D | | | D |
| Approach Delay (s/veh) | | | 13.2 | | | 17.6 | | | 49.5 | | | 37.0 |
| Approach LOS | | | B | | | B | | | D | | | D |
| 90th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| 90th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Max | Max | | Max | Max |
| 70th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| 70th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Max | Max | | Max | Max |
| 50th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 5.5 | 37.0 | | 27.0 | 27.0 |
| 50th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Max | Max | | Max | Max |
| 30th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 38.5 | 37.0 | | 0.0 | 0.0 |
| 30th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Hold | Max | | Skip | Skip |
| 10th %ile Green (s) | 71.0 | 71.0 | 71.0 | | 71.0 | 71.0 | | 38.5 | 37.0 | | 0.0 | 0.0 |
| 10th %ile Term Code | Coord | Coord | Coord | | Coord | Coord | | Hold | Max | | Skip | Skip |
| Stops (vph) | | 12 | 150 | | 27 | 343 | | 55 | 32 | | | 13 |
| Fuel Used(gal) | | 0 | 2 | | 0 | 5 | | 2 | 1 | | | 0 |
| CO Emissions (g/hr) | | 12 | 147 | | 27 | 339 | | 131 | 95 | | | 14 |
| NOx Emissions (g/hr) | | 2 | 29 | | 5 | 66 | | 25 | 18 | | | 3 |
| VOC Emissions (g/hr) | | 3 | 34 | | 6 | 78 | | 30 | 22 | | | 3 |
| Dilemma Vehicles (#) | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | 0 |
| Queue Length 50th (ft) | | 10 | 66 | | 24 | 150 | | ~129 | ~71 | | | 10 |
| Queue Length 95th (ft) | | 24 | 91 | | m34 | m185 | | #256 | #197 | | | 29 |
| Internal Link Dist (ft) | | | 165 | | | 478 | | | 426 | | | 311 |
| Turn Bay Length (ft) | | 100 | | | 100 | | | | | | | |
| Base Capacity (vph) | | 509 | 1963 | | 564 | 2030 | | 254 | 256 | | | 360 |

| Lane Group | SBR | Ø9 |
|-------------------------|-----|------|
| Permitted Phases | | |
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | | 18.0 |
| Minimum Split (s) | | 24.0 |
| Total Split (s) | | 24.0 |
| Total Split (%) | | 20% |
| Maximum Green (s) | | 18.0 |
| Yellow Time (s) | | 3.0 |
| All-Red Time (s) | | 3.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | | |
| Lead-Lag Optimize? | | |
| Vehicle Extension (s) | | 3.0 |
| Recall Mode | | None |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay (s/veh) | | |
| Queue Delay | | |
| Total Delay (s/veh) | | |
| LOS | | |
| Approach Delay (s/veh) | | |
| Approach LOS | | |
| 90th %ile Green (s) | | 0.0 |
| 90th %ile Term Code | | Skip |
| 70th %ile Green (s) | | 0.0 |
| 70th %ile Term Code | | Skip |
| 50th %ile Green (s) | | 0.0 |
| 50th %ile Term Code | | Skip |
| 30th %ile Green (s) | | 0.0 |
| 30th %ile Term Code | | Skip |
| 10th %ile Green (s) | | 0.0 |
| 10th %ile Term Code | | Skip |
| Stops (vph) | | |
| Fuel Used(gal) | | |
| CO Emissions (g/hr) | | |
| NOx Emissions (g/hr) | | |
| VOC Emissions (g/hr) | | |
| Dilemma Vehicles (#) | | |
| Queue Length 50th (ft) | | |
| Queue Length 95th (ft) | | |
| Internal Link Dist (ft) | | |
| Turn Bay Length (ft) | | |
| Base Capacity (vph) | | |

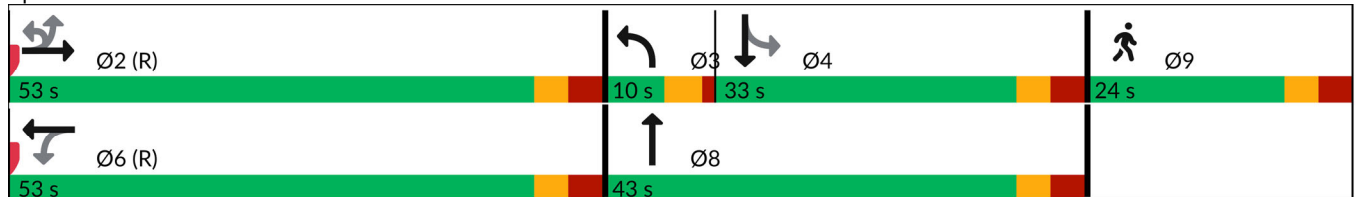


| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|------------------------|-----|------|------|-----|------|------|-----|------|------|-----|-----|------|
| Starvation Cap Reductn | | 0 | 1401 | | 0 | 0 | | 0 | 0 | | | 0 |
| Spillback Cap Reductn | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | 0 |
| Storage Cap Reductn | | 0 | 0 | | 0 | 0 | | 0 | 0 | | | 0 |
| Reduced v/c Ratio | | 0.06 | 0.67 | | 0.07 | 0.22 | | 0.45 | 0.42 | | | 0.04 |

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay (s/veh): 22.5 Intersection LOS: C
 Intersection Capacity Utilization 65.0% ICU Level of Service C
 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.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Cross Street



8: Cross Street



















| | | |
|------------------------|-----|----|
| Lane Group | SBR | Ø9 |
| Starvation Cap Reductn | | |
| Spillback Cap Reductn | | |
| Storage Cap Reductn | | |
| Reduced v/c Ratio | | |
| Intersection Summary | | |

TIP Before and After Evaluations - Somerville - Broadway PM

11: Glen St/Michigan Ave

12/20/2023

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  |  |  |  | | | | | | | |
| Traffic Volume (vph) | 24 | 244 | 55 | 73 | 449 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Future Volume (vph) | 24 | 244 | 55 | 73 | 449 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 50 | 75 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | 0.996 | | | | | | | |
| Flt Protected | | 0.996 | | 0.950 | | | | | | | | |
| Satd. Flow (prot) | 0 | 1785 | 1524 | 1703 | 1785 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flt Permitted | | 0.996 | | 0.950 | | | | | | | | |
| Satd. Flow (perm) | 0 | 1785 | 1524 | 1703 | 1785 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Link Speed (mph) | | 25 | | | 25 | | | 20 | | | | 20 |
| Link Distance (ft) | | 558 | | | 527 | | | 639 | | | | 396 |
| Travel Time (s) | | 15.2 | | | 14.4 | | | 21.8 | | | | 13.5 |
| 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 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Adj. Flow (vph) | 26 | 265 | 60 | 79 | 488 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 291 | 60 | 79 | 501 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Free | | | Free | | | Stop | | | | Stop |
| Intersection Summary | | | | | | | | | | | | |
| Area Type: | Other | | | | | | | | | | | |
| Control Type: | Unsignalized | | | | | | | | | | | |
| Intersection Capacity Utilization | 45.2% | | | | | | ICU Level of Service A | | | | | |
| Analysis Period (min) | 15 | | | | | | | | | | | |

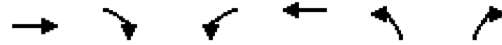
TIP Before and After Evaluations - Somerville - Broadway PM
 14: Franklin Street & Broadway

12/20/2023

| | → | ↘ | ↙ | ← | ↖ | ↗ | |
|----------------------------|-------|-------|------|-------|-------|-------|----|
| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | Ø9 |
| Lane Configurations | ↑ | | | ↑ | ↘↙ | | |
| Traffic Volume (vph) | 314 | 0 | 0 | 356 | 93 | 59 | |
| Future Volume (vph) | 314 | 0 | 0 | 356 | 93 | 59 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Fr _t | | | | | 0.948 | | |
| Fl _t Protected | | | | | 0.970 | | |
| Satd. Flow (prot) | 1792 | 0 | 0 | 1792 | 1648 | 0 | |
| Fl _t Permitted | | | | | 0.970 | | |
| Satd. Flow (perm) | 1792 | 0 | 0 | 1792 | 1648 | 0 | |
| Right Turn on Red | | Yes | | | | Yes | |
| Satd. Flow (RTOR) | | | | | 24 | | |
| Link Speed (mph) | 25 | | | 25 | 25 | | |
| Link Distance (ft) | 527 | | | 1045 | 888 | | |
| Travel Time (s) | 14.4 | | | 28.5 | 24.2 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | |
| Adj. Flow (vph) | 341 | 0 | 0 | 387 | 101 | 64 | |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 341 | 0 | 0 | 387 | 165 | 0 | |
| Enter Blocked Intersection | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | |
| Median Width(ft) | 17 | | | 17 | 12 | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 | |
| Number of Detectors | 2 | | | 2 | 1 | | |
| Detector Template | Thru | | | Thru | Left | | |
| Leading Detector (ft) | 100 | | | 100 | 20 | | |
| Trailing Detector (ft) | 0 | | | 0 | 0 | | |
| Detector 1 Position(ft) | 0 | | | 0 | 0 | | |
| Detector 1 Size(ft) | 6 | | | 6 | 20 | | |
| Detector 1 Type | Cl+Ex | | | Cl+Ex | Cl+Ex | | |
| Detector 1 Channel | | | | | | | |
| Detector 1 Extend (s) | 0.0 | | | 0.0 | 0.0 | | |
| Detector 1 Queue (s) | 0.0 | | | 0.0 | 0.0 | | |
| Detector 1 Delay (s) | 0.0 | | | 0.0 | 0.0 | | |
| Detector 2 Position(ft) | 94 | | | 94 | | | |
| Detector 2 Size(ft) | 6 | | | 6 | | | |
| Detector 2 Type | Cl+Ex | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | | |
| Turn Type | NA | | | NA | Prot | | |
| Protected Phases | 2 | | | 6 | 4 | 9 | |
| Permitted Phases | | | | | | | |
| Detector Phase | 2 | | | 6 | 4 | | |
| Switch Phase | | | | | | | |

TIP Before and After Evaluations - Somerville - Broadway PM
 14: Franklin Street & Broadway

12/20/2023



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | Ø9 |
|-------------------------|-------|-----|-----|-------|-------|-----|------|
| Minimum Initial (s) | 15.0 | | | 11.0 | 7.0 | | 11.0 |
| Minimum Split (s) | 24.0 | | | 24.0 | 24.0 | | 17.0 |
| Total Split (s) | 37.0 | | | 37.0 | 29.0 | | 17.0 |
| Total Split (%) | 30.8% | | | 30.8% | 24.2% | | 14% |
| Maximum Green (s) | 31.0 | | | 31.0 | 23.0 | | 11.0 |
| Yellow Time (s) | 3.0 | | | 3.0 | 3.0 | | 3.0 |
| All-Red Time (s) | 3.0 | | | 3.0 | 3.0 | | 3.0 |
| Lost Time Adjust (s) | 0.0 | | | 0.0 | 0.0 | | |
| Total Lost Time (s) | 6.0 | | | 6.0 | 6.0 | | |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Vehicle Extension (s) | 3.0 | | | 3.0 | 3.0 | | 3.0 |
| Recall Mode | C-Max | | | None | None | | None |
| Walk Time (s) | 7.0 | | | 7.0 | 7.0 | | |
| Flash Dont Walk (s) | 11.0 | | | 11.0 | 11.0 | | |
| Pedestrian Calls (#/hr) | 51 | | | 6 | 51 | | |
| Act Effct Green (s) | 56.1 | | | 28.8 | 17.1 | | |
| Actuated g/C Ratio | 0.47 | | | 0.24 | 0.14 | | |
| v/c Ratio | 0.41 | | | 0.90 | 0.65 | | |
| Control Delay (s/veh) | 21.2 | | | 68.7 | 52.7 | | |
| Queue Delay | 0.0 | | | 0.0 | 0.0 | | |
| Total Delay (s/veh) | 21.2 | | | 68.7 | 52.7 | | |
| LOS | C | | | E | D | | |
| Approach Delay (s/veh) | 21.2 | | | 68.7 | 52.7 | | |
| Approach LOS | C | | | E | D | | |
| 90th %ile Green (s) | 48.9 | | | 31.0 | 22.1 | | 0.0 |
| 90th %ile Term Code | Coord | | | Max | Gap | | Skip |
| 70th %ile Green (s) | 52.7 | | | 31.0 | 18.3 | | 0.0 |
| 70th %ile Term Code | Coord | | | Max | Gap | | Skip |
| 50th %ile Green (s) | 53.0 | | | 31.0 | 18.0 | | 0.0 |
| 50th %ile Term Code | Coord | | | Max | Ped | | Skip |
| 30th %ile Green (s) | 55.8 | | | 28.2 | 18.0 | | 0.0 |
| 30th %ile Term Code | Coord | | | Gap | Ped | | Skip |
| 10th %ile Green (s) | 69.9 | | | 23.0 | 9.1 | | 0.0 |
| 10th %ile Term Code | Coord | | | Gap | Gap | | Skip |
| Stops (vph) | 162 | | | 326 | 121 | | |
| Fuel Used(gal) | 3 | | | 9 | 3 | | |
| CO Emissions (g/hr) | 237 | | | 657 | 227 | | |
| NOx Emissions (g/hr) | 46 | | | 128 | 44 | | |
| VOC Emissions (g/hr) | 55 | | | 152 | 53 | | |
| Dilemma Vehicles (#) | 0 | | | 0 | 0 | | |
| Queue Length 50th (ft) | 140 | | | 285 | 103 | | |
| Queue Length 95th (ft) | 195 | | | #446 | 171 | | |
| Internal Link Dist (ft) | 447 | | | 965 | 808 | | |
| Turn Bay Length (ft) | | | | | | | |
| Base Capacity (vph) | 837 | | | 462 | 335 | | |
| Starvation Cap Reductn | 0 | | | 0 | 0 | | |
| Spillback Cap Reductn | 0 | | | 0 | 0 | | |
| Storage Cap Reductn | 0 | | | 0 | 0 | | |

14: Franklin Street & Broadway



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | Ø9 |
|-------------------|------|-----|-----|------|------|-----|----|
| Reduced v/c Ratio | 0.41 | | | 0.84 | 0.49 | | |

Intersection Summary

| | |
|---|---|
| Area Type: | Other |
| Cycle Length: | 120 |
| Actuated Cycle Length: | 120 |
| Offset: | 0 (0%), Referenced to phase 2:EBT, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.90 |
| Intersection Signal Delay (s/veh): | 47.6 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 37.5% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

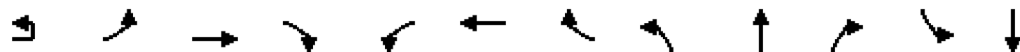
Splits and Phases: 14: Franklin Street & Broadway



TIP Before and After Evaluations - Somerville - Broadway PM

16: Broadway & Lombardi Street

12/20/2023



| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 120 | 175 | 0 | 0 | 0 | 0 | 22 | 207 | 48 | 270 | 0 |
| Future Volume (vph) | 2 | 120 | 175 | 0 | 0 | 0 | 0 | 22 | 207 | 48 | 270 | 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 | |
| Storage Lanes | | 1 | | 0 | 0 | | 0 | 0 | | 0 | 1 | |
| 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 | | | | | | | | | 0.977 | | | |
| Flt Protected | | 0.950 | | | | | | | 0.996 | | 0.950 | |
| Satd. Flow (prot) | 0 | 1719 | 1810 | 0 | 0 | 0 | 0 | 0 | 1761 | 0 | 1719 | 0 |
| Flt Permitted | | 0.950 | | | | | | | 0.996 | | 0.529 | |
| Satd. Flow (perm) | 0 | 1719 | 1810 | 0 | 0 | 0 | 0 | 0 | 1761 | 0 | 957 | 0 |
| Right Turn on Red | | | | Yes | | | Yes | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | | | | 17 | | | |
| Link Speed (mph) | | | 25 | | | 25 | | | 25 | | | 25 |
| Link Distance (ft) | | | 1045 | | | 535 | | | 692 | | | 390 |
| Travel Time (s) | | | 28.5 | | | 14.6 | | | 18.9 | | | 10.6 |
| 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 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% | 5% |
| Adj. Flow (vph) | 2 | 130 | 190 | 0 | 0 | 0 | 0 | 24 | 225 | 52 | 293 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 132 | 190 | 0 | 0 | 0 | 0 | 0 | 301 | 0 | 293 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left |
| Median Width(ft) | | | 15 | | | 15 | | | 20 | | | 20 |
| Link Offset(ft) | | | 0 | | | 0 | | | 0 | | | 0 |
| Crosswalk Width(ft) | | | 16 | | | 16 | | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway 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 |
| Turning Speed (mph) | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | |
| Number of Detectors | 1 | 1 | 2 | | | | | 1 | 2 | | | 1 |
| Detector Template | Left | Left | Thru | | | | | Left | Thru | | Left | |
| Leading Detector (ft) | 20 | 20 | 100 | | | | | 20 | 100 | | 20 | |
| Trailing Detector (ft) | 0 | 0 | 0 | | | | | 0 | 0 | | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | | | | | 0 | 0 | | 0 | |
| Detector 1 Size(ft) | 20 | 20 | 6 | | | | | 20 | 6 | | 20 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | | | Cl+Ex | Cl+Ex | | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Detector 2 Position(ft) | | | 94 | | | | | | 94 | | | |
| Detector 2 Size(ft) | | | 6 | | | | | | 6 | | | |
| Detector 2 Type | | | Cl+Ex | | | | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | 0.0 | | | | | | 0.0 | | | |
| Turn Type | Perm | Perm | NA | | | | | Perm | NA | | Perm | |
| Protected Phases | | | 4 | | | | | | 2 | | | |

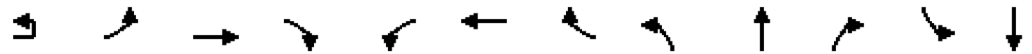
TIP Before and After Evaluations - Somerville - Broadway PM
 16: Broadway & Lombardi Street

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| | |
|----------------------------|-------|
| Lane Group | SBR |
| Lane Configurations | 7 |
| Traffic Volume (vph) | 398 |
| Future Volume (vph) | 398 |
| Ideal Flow (vphpl) | 1900 |
| Storage Length (ft) | 0 |
| Storage Lanes | 1 |
| Taper Length (ft) | |
| Lane Util. Factor | 1.00 |
| Frt | 0.850 |
| Flt Protected | |
| Satd. Flow (prot) | 1538 |
| Flt Permitted | |
| Satd. Flow (perm) | 1538 |
| Right Turn on Red | Yes |
| Satd. Flow (RTOR) | 433 |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | 0.92 |
| Heavy Vehicles (%) | 5% |
| Adj. Flow (vph) | 433 |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | 433 |
| Enter Blocked Intersection | No |
| Lane Alignment | Right |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | 1.00 |
| Turning Speed (mph) | 9 |
| Number of Detectors | 1 |
| Detector Template | Right |
| Leading Detector (ft) | 20 |
| Trailing Detector (ft) | 0 |
| Detector 1 Position(ft) | 0 |
| Detector 1 Size(ft) | 20 |
| Detector 1 Type | Cl+Ex |
| Detector 1 Channel | |
| Detector 1 Extend (s) | 0.0 |
| Detector 1 Queue (s) | 0.0 |
| Detector 1 Delay (s) | 0.0 |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | Perm |
| Protected Phases | |

TIP Before and After Evaluations - Somerville - Broadway PM
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| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|-------------------------|-------|-------|-------|-----|-----|-----|-----|-------|-------|-----|-------|------|
| Permitted Phases | 4 | 4 | | | | | | 2 | | | 6 | |
| Detector Phase | 4 | 4 | 4 | | | | | 2 | 2 | | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 32.0 | 32.0 | 32.0 | | | | | 16.0 | 16.0 | | 24.0 | |
| Minimum Split (s) | 38.0 | 38.0 | 38.0 | | | | | 25.0 | 25.0 | | 30.0 | |
| Total Split (s) | 38.0 | 38.0 | 38.0 | | | | | 30.0 | 30.0 | | 30.0 | |
| Total Split (%) | 55.9% | 55.9% | 55.9% | | | | | 44.1% | 44.1% | | 44.1% | |
| Maximum Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| Yellow Time (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| All-Red Time (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | | | | | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 6.0 | 6.0 | | | | | | 6.0 | | 6.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | None | None | None | | | | | C-Max | C-Max | | C-Max | |
| Walk Time (s) | 7.0 | 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) | 2 | 2 | 2 | | | | | 83 | 83 | | 10 | |
| Act Effct Green (s) | | 32.0 | 32.0 | | | | | | 24.0 | | 24.0 | |
| Actuated g/C Ratio | | 0.47 | 0.47 | | | | | | 0.35 | | 0.35 | |
| v/c Ratio | | 0.16 | 0.22 | | | | | | 0.48 | | 0.87 | |
| Control Delay (s/veh) | | 11.0 | 11.5 | | | | | | 19.2 | | 49.2 | |
| Queue Delay | | 0.0 | 0.0 | | | | | | 0.0 | | 0.0 | |
| Total Delay (s/veh) | | 11.0 | 11.5 | | | | | | 19.2 | | 49.2 | |
| LOS | | B | B | | | | | | B | | D | |
| Approach Delay (s/veh) | | | 11.3 | | | | | | 19.2 | | | 22.5 |
| Approach LOS | | | B | | | | | | B | | | C |
| 90th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 90th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 70th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 70th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 50th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 50th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 30th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 30th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| 10th %ile Green (s) | 32.0 | 32.0 | 32.0 | | | | | 24.0 | 24.0 | | 24.0 | |
| 10th %ile Term Code | Max | Max | Max | | | | | Coord | Coord | | Coord | |
| Stops (vph) | | 65 | 98 | | | | | | 197 | | 218 | |
| Fuel Used(gal) | | 2 | 2 | | | | | | 3 | | 4 | |
| CO Emissions (g/hr) | | 112 | 164 | | | | | | 243 | | 310 | |
| NOx Emissions (g/hr) | | 22 | 32 | | | | | | 47 | | 60 | |
| VOC Emissions (g/hr) | | 26 | 38 | | | | | | 56 | | 72 | |
| Dilemma Vehicles (#) | | 0 | 0 | | | | | | 0 | | 0 | |
| Queue Length 50th (ft) | | 30 | 44 | | | | | | 90 | | 112 | |
| Queue Length 95th (ft) | | 59 | 81 | | | | | | 156 | | #248 | |
| Internal Link Dist (ft) | | | 965 | | | 455 | | | 612 | | | 310 |
| Turn Bay Length (ft) | | 150 | | | | | | | | | | |
| Base Capacity (vph) | | 808 | 851 | | | | | | 632 | | 337 | |

TIP Before and After Evaluations - Somerville - Broadway PM
 16: Broadway & Lombardi Street

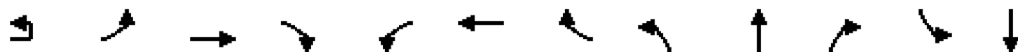
12/20/2023

| Lane Group | SBR |
|-------------------------|-------|
| Permitted Phases | 6 |
| Detector Phase | 6 |
| Switch Phase | |
| Minimum Initial (s) | 24.0 |
| Minimum Split (s) | 30.0 |
| Total Split (s) | 30.0 |
| Total Split (%) | 44.1% |
| Maximum Green (s) | 24.0 |
| Yellow Time (s) | 3.0 |
| All-Red Time (s) | 3.0 |
| Lost Time Adjust (s) | 0.0 |
| Total Lost Time (s) | 6.0 |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | C-Max |
| Walk Time (s) | 7.0 |
| Flash Dont Walk (s) | 11.0 |
| Pedestrian Calls (#/hr) | 10 |
| Act Effct Green (s) | 24.0 |
| Actuated g/C Ratio | 0.35 |
| v/c Ratio | 0.53 |
| Control Delay (s/veh) | 4.5 |
| Queue Delay | 0.0 |
| Total Delay (s/veh) | 4.5 |
| LOS | A |
| Approach Delay (s/veh) | |
| Approach LOS | |
| 90th %ile Green (s) | 24.0 |
| 90th %ile Term Code | Coord |
| 70th %ile Green (s) | 24.0 |
| 70th %ile Term Code | Coord |
| 50th %ile Green (s) | 24.0 |
| 50th %ile Term Code | Coord |
| 30th %ile Green (s) | 24.0 |
| 30th %ile Term Code | Coord |
| 10th %ile Green (s) | 24.0 |
| 10th %ile Term Code | Coord |
| Stops (vph) | 42 |
| Fuel Used(gal) | 2 |
| CO Emissions (g/hr) | 129 |
| NOx Emissions (g/hr) | 25 |
| VOC Emissions (g/hr) | 30 |
| Dilemma Vehicles (#) | 0 |
| Queue Length 50th (ft) | 0 |
| Queue Length 95th (ft) | 54 |
| Internal Link Dist (ft) | |
| Turn Bay Length (ft) | |
| Base Capacity (vph) | 823 |

TIP Before and After Evaluations - Somerville - Broadway PM

16: Broadway & Lombardi Street

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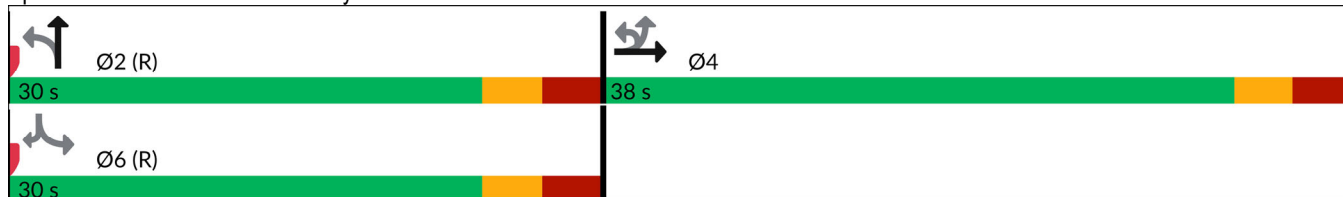


| Lane Group | EBU | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT |
|------------------------|-----|------|------|-----|-----|-----|-----|-----|------|-----|------|-----|
| Starvation Cap Reductn | | 0 | 0 | | | | | | 0 | | 0 | |
| Spillback Cap Reductn | | 0 | 0 | | | | | | 0 | | 0 | |
| Storage Cap Reductn | | 0 | 0 | | | | | | 0 | | 0 | |
| Reduced v/c Ratio | | 0.16 | 0.22 | | | | | | 0.48 | | 0.87 | |

Intersection Summary

| | |
|---|--|
| Area Type: | Other |
| Cycle Length: | 68 |
| Actuated Cycle Length: | 68 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBL, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.87 |
| Intersection Signal Delay (s/veh): | 19.1 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 81.3% |
| 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: 16: Broadway & Lombardi Street





| Lane Group | SBR |
|------------------------|------|
| Starvation Cap Reductn | 0 |
| Spillback Cap Reductn | 0 |
| Storage Cap Reductn | 0 |
| Reduced v/c Ratio | 0.53 |
| Intersection Summary | |