

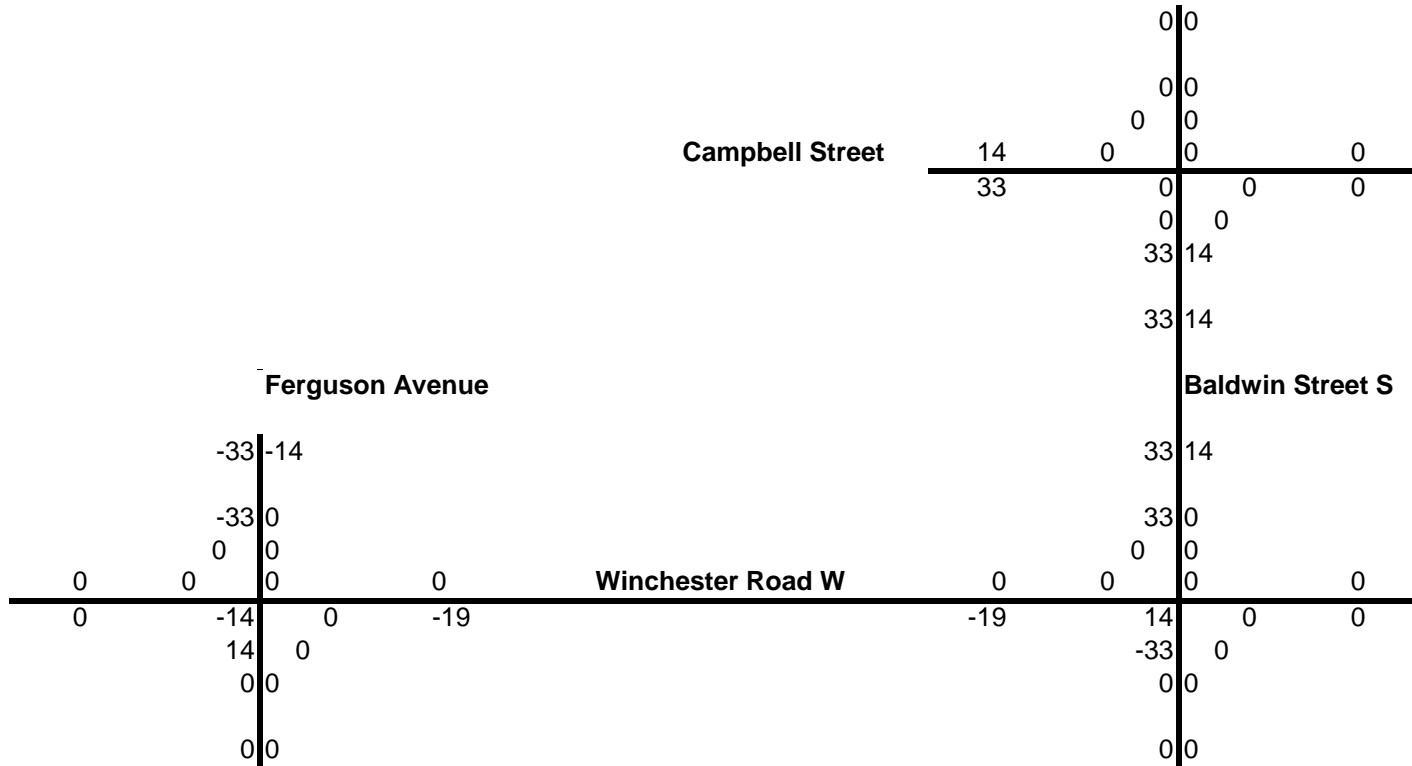
## **APPENDIX C**

### **Sensitivity Analysis: Modifications to Ferguson Avenue**

**Alternative 2 - Ferguson Avenue / Winchester Road W**

Diverted Traffic

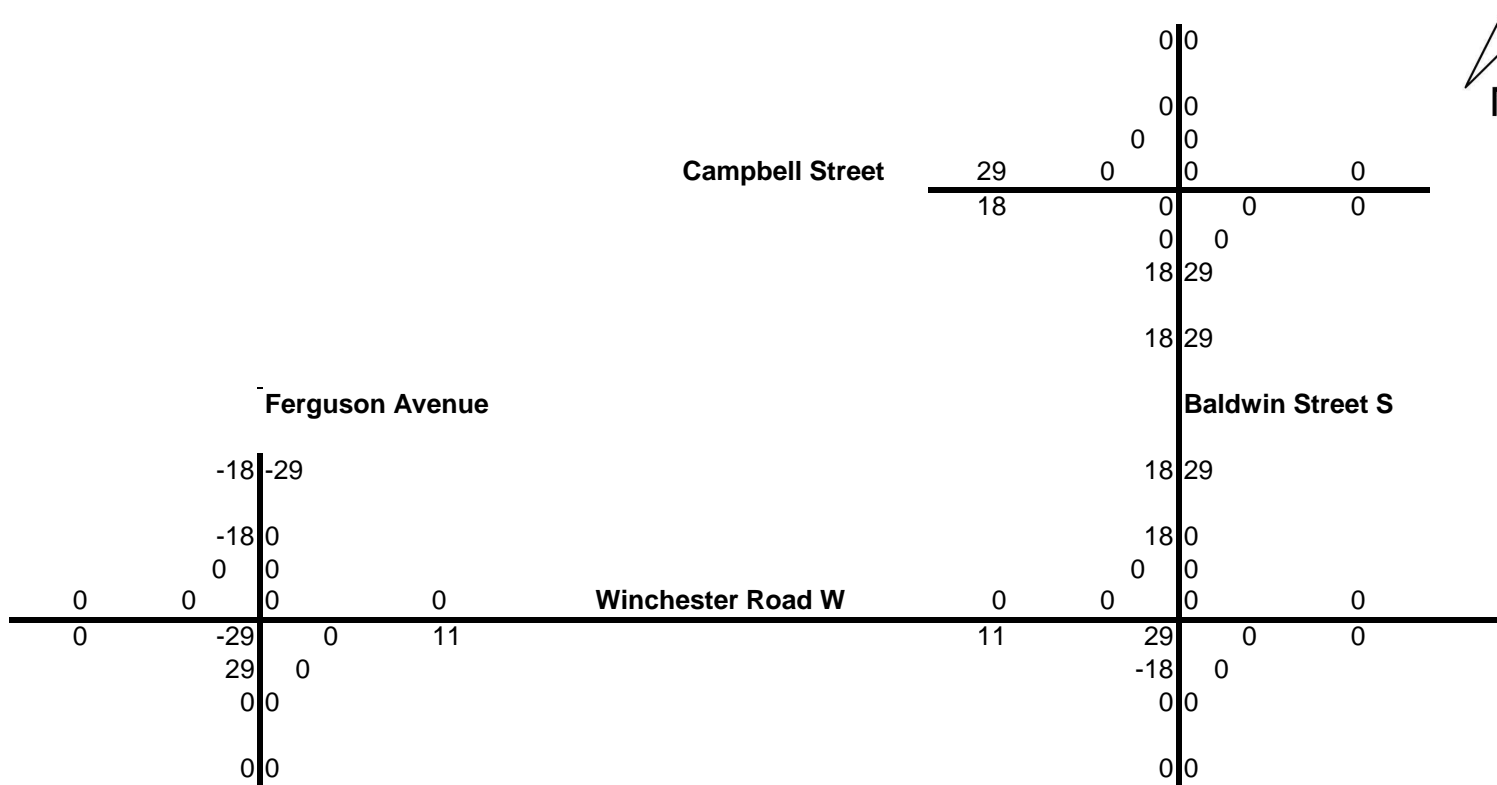
2016 Condition - AM Peak



**Alternative 2 - Ferguson Avenue / Winchester Road W**

Diverted Traffic

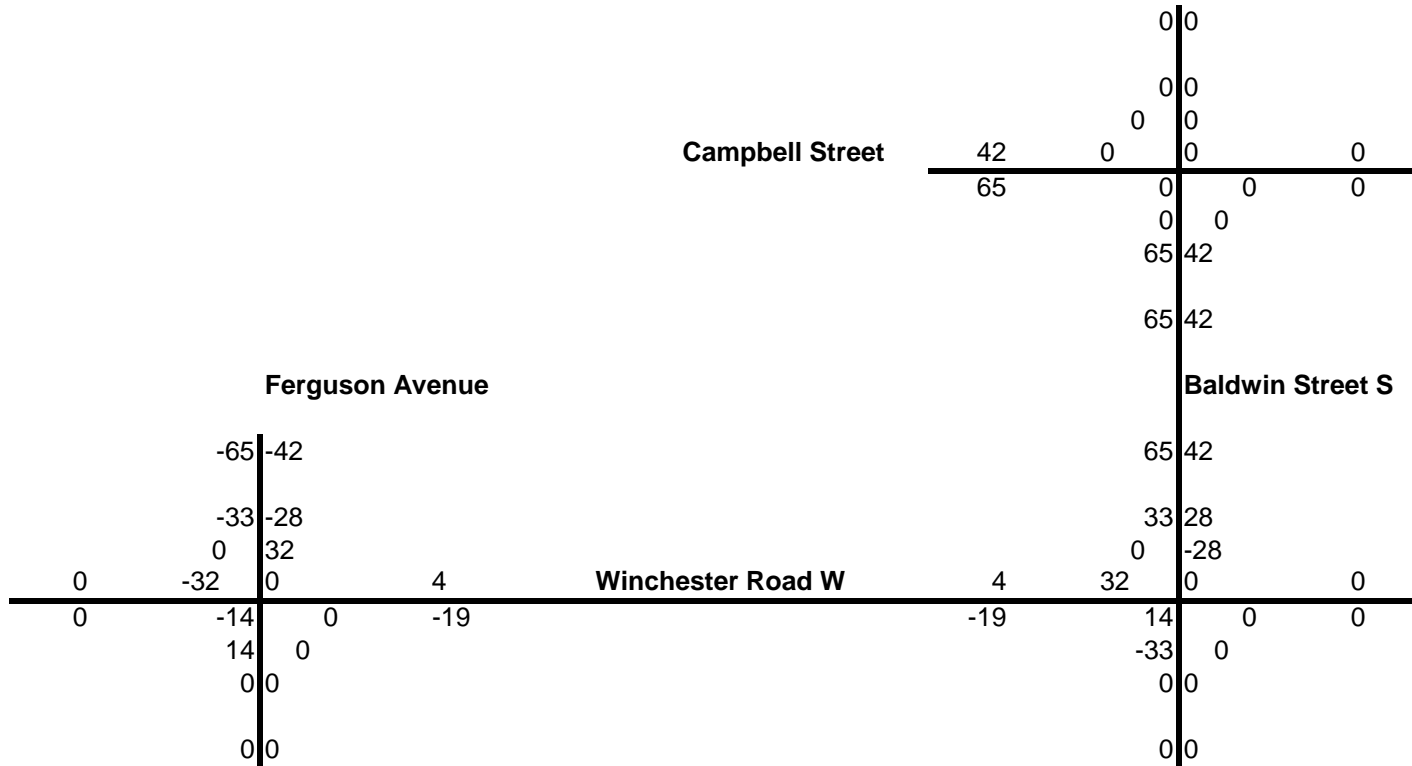
2016 Condition - PM Peak



**Alternative 3 - Ferguson Avenue / Winchester Road W**

Diverted Traffic

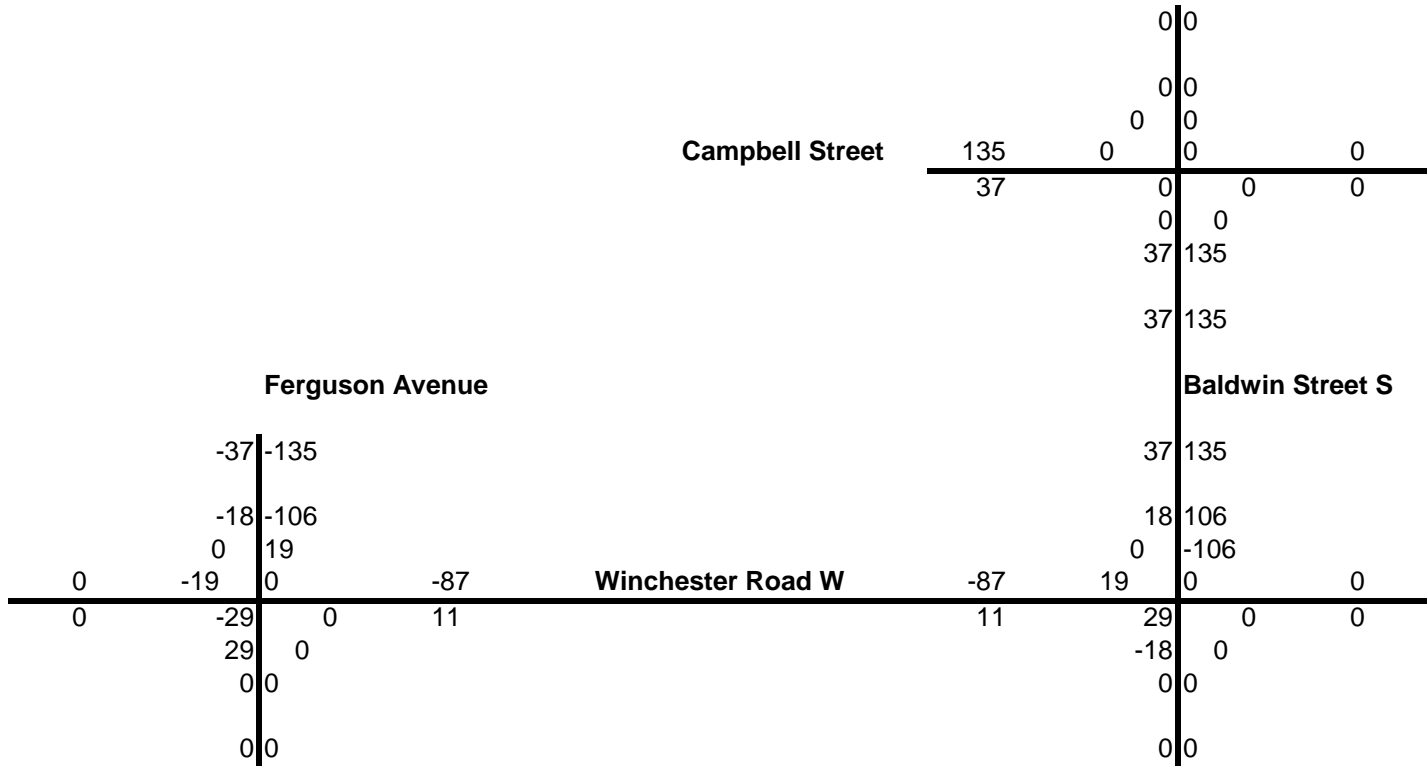
2016 Condition - AM Peak



**Alternative 3 - Ferguson Avenue / Winchester Road W**

Diverted Traffic

2016 Condition - PM Peak



HCM Signalized Intersection Capacity Analysis  
 11: Winchester Road W & Ferguson Avenue

2016 Condition - Alt. 1  
 AM Peak Hour



| Movement               | EBL  | EBT  | EBR  | WBL  | WBT   | WBR  | NBL    | NBT  | NBR    | SBL  | SBT  | SBR  |
|------------------------|------|------|------|------|-------|------|--------|------|--------|------|------|------|
| Lane Configurations    |      |      |      |      |       |      |        |      |        |      |      |      |
| Volume (vph)           | 14   | 689  | 246  | 137  | 952   | 28   | 112    | 0    | 38     | 33   | 0    | 32   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900   | 1900 | 1900   | 1900 | 1900 | 1900 |
| Total Lost time (s)    | 6.0  | 6.0  | 6.0  | 6.0  | 6.0   |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Lane Util. Factor      | 1.00 | 0.95 | 1.00 | 1.00 | 0.95  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frbp, ped/bikes        | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Flpb, ped/bikes        | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frt                    | 1.00 | 1.00 | 0.85 | 1.00 | 1.00  |      | 1.00   |      | 0.85   |      | 0.93 |      |
| Flt Protected          | 0.95 | 1.00 | 1.00 | 0.95 | 1.00  |      | 0.95   |      | 1.00   |      | 0.98 |      |
| Satd. Flow (prot)      | 1825 | 3288 | 1601 | 1789 | 3423  |      | 1789   |      | 1601   |      | 1749 |      |
| Flt Permitted          | 0.22 | 1.00 | 1.00 | 0.36 | 1.00  |      | 0.71   |      | 1.00   |      | 0.98 |      |
| Satd. Flow (perm)      | 432  | 3288 | 1601 | 686  | 3423  |      | 1339   |      | 1601   |      | 1749 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92   | 0.92 | 0.92   | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)        | 15   | 749  | 267  | 149  | 1035  | 30   | 122    | 0    | 41     | 36   | 0    | 35   |
| RTOR Reduction (vph)   | 0    | 0    | 127  | 0    | 3     | 0    | 0      | 0    | 32     | 0    | 27   | 0    |
| Lane Group Flow (vph)  | 15   | 749  | 140  | 149  | 1062  | 0    | 122    | 0    | 9      | 0    | 44   | 0    |
| Confl. Peds. (#/hr)    | 1    |      |      |      |       | 1    |        |      |        |      |      |      |
| Heavy Vehicles (%)     | 0%   | 11%  | 2%   | 2%   | 6%    | 10%  | 2%     | 2%   | 2%     | 0%   | 2%   | 0%   |
| Turn Type              | Perm |      | Perm | Perm |       |      | custom |      | custom |      | Perm |      |
| Protected Phases       |      | 4    |      |      | 8     |      |        |      |        |      |      | 6    |
| Permitted Phases       | 4    |      | 4    | 8    |       |      | 2      |      | 2      | 6    |      |      |
| Actuated Green, G (s)  | 24.5 | 24.5 | 24.5 | 24.5 | 24.5  |      | 10.1   |      | 10.1   |      | 10.1 |      |
| Effective Green, g (s) | 24.5 | 24.5 | 24.5 | 24.5 | 24.5  |      | 10.1   |      | 10.1   |      | 10.1 |      |
| Actuated g/C Ratio     | 0.53 | 0.53 | 0.53 | 0.53 | 0.53  |      | 0.22   |      | 0.22   |      | 0.22 |      |
| Clearance Time (s)     | 6.0  | 6.0  | 6.0  | 6.0  | 6.0   |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Vehicle Extension (s)  | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   |      | 3.0    |      | 3.0    |      | 3.0  |      |
| Lane Grp Cap (vph)     | 227  | 1729 | 842  | 361  | 1800  |      | 290    |      | 347    |      | 379  |      |
| v/s Ratio Prot         |      | 0.23 |      |      | c0.31 |      |        |      |        |      |      |      |
| v/s Ratio Perm         | 0.03 |      | 0.09 | 0.22 |       |      | c0.09  |      | 0.01   |      | 0.02 |      |
| v/c Ratio              | 0.07 | 0.43 | 0.17 | 0.41 | 0.59  |      | 0.42   |      | 0.03   |      | 0.12 |      |
| Uniform Delay, d1      | 5.4  | 6.8  | 5.7  | 6.7  | 7.6   |      | 15.7   |      | 14.4   |      | 14.7 |      |
| Progression Factor     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Incremental Delay, d2  | 0.1  | 0.2  | 0.1  | 0.8  | 0.5   |      | 1.0    |      | 0.0    |      | 0.1  |      |
| Delay (s)              | 5.6  | 7.0  | 5.8  | 7.5  | 8.1   |      | 16.7   |      | 14.4   |      | 14.8 |      |
| Level of Service       | A    | A    | A    | A    | A     |      | B      |      | B      |      | B    |      |
| Approach Delay (s)     |      | 6.6  |      |      | 8.0   |      |        | 16.1 |        |      | 14.8 |      |
| Approach LOS           |      | A    |      |      | A     |      |        | B    |        |      | B    |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 8.2   | HCM Level of Service | A    |
| HCM Volume to Capacity ratio      | 0.54  |                      |      |
| Actuated Cycle Length (s)         | 46.6  | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 56.0% | ICU Level of Service | B    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
6: Campbell Street & Baldwin Street N

2016 Condition - Alt. 1  
AM Peak Hour



| Movement               | EBL  | EBR   | NBL   | NBT  | SBT   | SBR  |
|------------------------|------|-------|-------|------|-------|------|
| Lane Configurations    |      |       |       |      |       |      |
| Volume (vph)           | 5    | 293   | 150   | 392  | 666   | 34   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 |
| Total Lost time (s)    | 4.0  | 4.0   | 4.0   | 6.0  | 6.0   |      |
| Lane Util. Factor      | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Frbp, ped/bikes        | 1.00 | 0.96  | 1.00  | 1.00 | 1.00  |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Frt                    | 1.00 | 0.85  | 1.00  | 1.00 | 0.99  |      |
| Flt Protected          | 0.95 | 1.00  | 0.95  | 1.00 | 1.00  |      |
| Satd. Flow (prot)      | 1825 | 1522  | 1722  | 1830 | 1812  |      |
| Flt Permitted          | 0.95 | 1.00  | 0.21  | 1.00 | 1.00  |      |
| Satd. Flow (perm)      | 1825 | 1522  | 381   | 1830 | 1812  |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92  | 0.92 | 0.92  | 0.92 |
| Adj. Flow (vph)        | 5    | 318   | 163   | 426  | 724   | 37   |
| RTOR Reduction (vph)   | 0    | 252   | 0     | 0    | 2     | 0    |
| Lane Group Flow (vph)  | 5    | 66    | 163   | 426  | 759   | 0    |
| Confl. Peds. (#/hr)    |      | 10    | 5     |      |       | 5    |
| Heavy Vehicles (%)     | 0%   | 3%    | 6%    | 5%   | 5%    | 9%   |
| Turn Type              |      | Perm  | pm+pt |      |       |      |
| Protected Phases       | 4    |       | 5     | 2    | 6     |      |
| Permitted Phases       |      | 4     | 2     |      |       |      |
| Actuated Green, G (s)  | 8.6  | 8.6   | 45.7  | 45.7 | 36.9  |      |
| Effective Green, g (s) | 8.6  | 8.6   | 45.7  | 45.7 | 36.9  |      |
| Actuated g/C Ratio     | 0.13 | 0.13  | 0.71  | 0.71 | 0.57  |      |
| Clearance Time (s)     | 4.0  | 4.0   | 4.0   | 6.0  | 6.0   |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0   | 3.0  | 3.0   |      |
| Lane Grp Cap (vph)     | 244  | 204   | 371   | 1301 | 1040  |      |
| v/s Ratio Prot         | 0.00 |       | c0.03 | 0.23 | c0.42 |      |
| v/s Ratio Perm         |      | c0.04 | 0.28  |      |       |      |
| v/c Ratio              | 0.02 | 0.32  | 0.44  | 0.33 | 0.73  |      |
| Uniform Delay, d1      | 24.2 | 25.2  | 6.3   | 3.5  | 10.0  |      |
| Progression Factor     | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Incremental Delay, d2  | 0.0  | 0.9   | 0.8   | 0.7  | 4.5   |      |
| Delay (s)              | 24.2 | 26.1  | 7.1   | 4.2  | 14.5  |      |
| Level of Service       | C    | C     | A     | A    | B     |      |
| Approach Delay (s)     | 26.1 |       |       | 5.0  | 14.5  |      |
| Approach LOS           | C    |       |       | A    | B     |      |

| Intersection Summary              |  |       |                           |
|-----------------------------------|--|-------|---------------------------|
| HCM Average Control Delay         |  | 13.4  | HCM Level of Service B    |
| HCM Volume to Capacity ratio      |  | 0.64  |                           |
| Actuated Cycle Length (s)         |  | 64.3  | Sum of lost time (s) 14.0 |
| Intersection Capacity Utilization |  | 64.6% | ICU Level of Service C    |
| Analysis Period (min)             |  | 15    |                           |
| c Critical Lane Group             |  |       |                           |

HCM Signalized Intersection Capacity Analysis  
 12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 1  
 AM Peak Hour



| Movement               | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL   | NBT  | NBR  | SBL  | SBT   | SBR  |
|------------------------|-------|------|------|------|------|------|-------|------|------|------|-------|------|
| Lane Configurations    |       |      |      |      |      |      |       |      |      |      |       |      |
| Volume (vph)           | 84    | 365  | 273  | 261  | 1087 | 29   | 230   | 348  | 114  | 138  | 668   | 137  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Total Lost time (s)    | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |      | 2.0   | 7.0  |      | 7.0  | 7.0   | 7.0  |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00 | 1.00 | 0.95 |      | 1.00  | 0.95 |      | 1.00 | 0.95  | 1.00 |
| Frbp, ped/bikes        | 1.00  | 1.00 | 0.98 | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00  | 0.98 |
| Flpb, ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00  | 1.00 |
| Frt                    | 1.00  | 1.00 | 0.85 | 1.00 | 1.00 |      | 1.00  | 0.96 |      | 1.00 | 1.00  | 0.85 |
| Flt Protected          | 0.95  | 1.00 | 1.00 | 0.95 | 1.00 |      | 0.95  | 1.00 |      | 0.95 | 1.00  | 1.00 |
| Satd. Flow (prot)      | 1722  | 3411 | 1532 | 1719 | 3560 |      | 1738  | 3339 |      | 1782 | 3579  | 1503 |
| Flt Permitted          | 0.12  | 1.00 | 1.00 | 0.51 | 1.00 |      | 0.14  | 1.00 |      | 0.47 | 1.00  | 1.00 |
| Satd. Flow (perm)      | 217   | 3411 | 1532 | 917  | 3560 |      | 249   | 3339 |      | 877  | 3579  | 1503 |
| Peak-hour factor, PHF  | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 |
| Adj. Flow (vph)        | 91    | 397  | 297  | 284  | 1182 | 32   | 250   | 378  | 124  | 150  | 726   | 149  |
| RTOR Reduction (vph)   | 0     | 0    | 155  | 0    | 2    | 0    | 0     | 23   | 0    | 0    | 0     | 55   |
| Lane Group Flow (vph)  | 91    | 397  | 142  | 284  | 1212 | 0    | 250   | 479  | 0    | 150  | 726   | 94   |
| Confl. Peds. (#/hr)    | 3     |      | 2    | 2    |      | 3    | 2     |      | 5    | 5    |       | 2    |
| Heavy Vehicles (%)     | 6%    | 7%   | 5%   | 6%   | 2%   | 4%   | 5%    | 4%   | 7%   | 2%   | 2%    | 7%   |
| Turn Type              | Perm  |      | Perm | Perm |      |      | pm+pt |      |      | Perm |       | Perm |
| Protected Phases       |       | 4    |      |      | 8    |      | 5     | 2    |      |      | 6     |      |
| Permitted Phases       | 4     |      | 4    | 8    |      |      | 2     |      |      | 6    |       | 6    |
| Actuated Green, G (s)  | 57.2  | 57.2 | 57.2 | 57.2 | 57.2 |      | 48.8  | 48.8 |      | 27.4 | 27.4  | 27.4 |
| Effective Green, g (s) | 57.2  | 57.2 | 57.2 | 57.2 | 57.2 |      | 48.8  | 48.8 |      | 27.4 | 27.4  | 27.4 |
| Actuated g/C Ratio     | 0.48  | 0.48 | 0.48 | 0.48 | 0.48 |      | 0.41  | 0.41 |      | 0.23 | 0.23  | 0.23 |
| Clearance Time (s)     | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |      | 2.0   | 7.0  |      | 7.0  | 7.0   | 7.0  |
| Vehicle Extension (s)  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  |      | 3.0   | 3.0  |      | 3.0  | 3.0   | 3.0  |
| Lane Grp Cap (vph)     | 103   | 1626 | 730  | 437  | 1697 |      | 342   | 1358 |      | 200  | 817   | 343  |
| v/s Ratio Prot         |       | 0.12 |      |      | 0.34 |      | c0.12 | 0.14 |      |      | c0.20 |      |
| v/s Ratio Perm         | c0.42 |      | 0.09 | 0.31 |      |      | 0.18  |      |      | 0.17 |       | 0.06 |
| v/c Ratio              | 0.88  | 0.24 | 0.19 | 0.65 | 0.71 |      | 0.73  | 0.35 |      | 0.75 | 0.89  | 0.27 |
| Uniform Delay, d1      | 28.4  | 18.6 | 18.1 | 23.8 | 24.9 |      | 27.2  | 24.7 |      | 43.1 | 44.8  | 38.1 |
| Progression Factor     | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00 | 1.00  | 1.00 |
| Incremental Delay, d2  | 53.2  | 0.1  | 0.1  | 3.3  | 1.5  |      | 7.8   | 0.7  |      | 22.5 | 13.8  | 2.0  |
| Delay (s)              | 81.6  | 18.7 | 18.2 | 27.1 | 26.4 |      | 35.0  | 25.4 |      | 65.6 | 58.6  | 40.1 |
| Level of Service       | F     | B    | B    | C    | C    |      | D     | C    |      | E    | E     | D    |
| Approach Delay (s)     |       | 25.8 |      |      | 26.5 |      |       | 28.6 |      |      | 56.9  |      |
| Approach LOS           |       | C    |      |      | C    |      |       | C    |      |      | E     |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 34.4  | HCM Level of Service | C    |
| HCM Volume to Capacity ratio      | 0.85  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 99.7% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |



HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 1  
AM Peak Hour



| Movement               | EBL   | EBT  | EBR  | WBL  | WBT  | WBR   | NBL   | NBT  | NBR  | SBL  | SBT   | SBR  |
|------------------------|-------|------|------|------|------|-------|-------|------|------|------|-------|------|
| Lane Configurations    |       |      |      |      |      |       |       |      |      |      |       |      |
| Volume (vph)           | 84    | 365  | 273  | 261  | 1087 | 29    | 230   | 348  | 114  | 138  | 668   | 137  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900 | 1900 | 1900  | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Total Lost time (s)    | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |       | 2.0   | 7.0  | 7.0  | 7.0  | 7.0   | 7.0  |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00 | 1.00 | 0.95 |       | 1.00  | 0.95 | 1.00 | 1.00 | 0.95  | 1.00 |
| Frbp, ped/bikes        | 1.00  | 1.00 | 0.98 | 1.00 | 1.00 |       | 1.00  | 1.00 | 0.98 | 1.00 | 1.00  | 0.98 |
| Flpb, ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |       | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Frt                    | 1.00  | 1.00 | 0.85 | 1.00 | 1.00 |       | 1.00  | 1.00 | 0.85 | 1.00 | 1.00  | 0.85 |
| Flt Protected          | 0.95  | 1.00 | 1.00 | 0.95 | 1.00 |       | 0.95  | 1.00 | 1.00 | 0.95 | 1.00  | 1.00 |
| Satd. Flow (prot)      | 1722  | 3411 | 1532 | 1719 | 3560 |       | 1738  | 3510 | 1496 | 1781 | 3579  | 1503 |
| Flt Permitted          | 0.12  | 1.00 | 1.00 | 0.51 | 1.00 |       | 0.14  | 1.00 | 1.00 | 0.53 | 1.00  | 1.00 |
| Satd. Flow (perm)      | 217   | 3411 | 1532 | 917  | 3560 |       | 249   | 3510 | 1496 | 989  | 3579  | 1503 |
| Peak-hour factor, PHF  | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 |
| Adj. Flow (vph)        | 91    | 397  | 297  | 284  | 1182 | 32    | 250   | 378  | 124  | 150  | 726   | 149  |
| RTOR Reduction (vph)   | 0     | 0    | 155  | 0    | 2    | 0     | 0     | 0    | 74   | 0    | 0     | 55   |
| Lane Group Flow (vph)  | 91    | 397  | 142  | 284  | 1212 | 0     | 250   | 378  | 50   | 150  | 726   | 94   |
| Confl. Peds. (#/hr)    | 3     |      | 2    | 2    |      | 3     | 2     |      | 5    | 5    |       | 2    |
| Heavy Vehicles (%)     | 6%    | 7%   | 5%   | 6%   | 2%   | 4%    | 5%    | 4%   | 7%   | 2%   | 2%    | 7%   |
| Turn Type              | Perm  |      | Perm | Perm |      | pm+pt |       | Perm | Perm |      | Perm  |      |
| Protected Phases       |       | 4    |      |      | 8    |       | 5     | 2    |      |      |       | 6    |
| Permitted Phases       | 4     |      | 4    | 8    |      | 2     |       | 2    | 6    |      |       | 6    |
| Actuated Green, G (s)  | 57.2  | 57.2 | 57.2 | 57.2 | 57.2 | 48.8  | 48.8  | 48.8 | 27.4 | 27.4 | 27.4  | 27.4 |
| Effective Green, g (s) | 57.2  | 57.2 | 57.2 | 57.2 | 57.2 | 48.8  | 48.8  | 48.8 | 27.4 | 27.4 | 27.4  | 27.4 |
| Actuated g/C Ratio     | 0.48  | 0.48 | 0.48 | 0.48 | 0.48 | 0.41  | 0.41  | 0.41 | 0.23 | 0.23 | 0.23  | 0.23 |
| Clearance Time (s)     | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  | 2.0   | 7.0   | 7.0  | 7.0  | 7.0  | 7.0   | 7.0  |
| Vehicle Extension (s)  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  | 3.0   | 3.0   | 3.0  | 3.0  | 3.0  | 3.0   | 3.0  |
| Lane Grp Cap (vph)     | 103   | 1626 | 730  | 437  | 1697 |       | 342   | 1427 | 608  | 226  | 817   | 343  |
| v/s Ratio Prot         |       | 0.12 |      |      | 0.34 |       | c0.12 | 0.11 |      |      | c0.20 |      |
| v/s Ratio Perm         | c0.42 |      | 0.09 | 0.31 |      | 0.18  |       | 0.03 | 0.15 |      |       | 0.06 |
| v/c Ratio              | 0.88  | 0.24 | 0.19 | 0.65 | 0.71 | 0.73  | 0.26  | 0.08 | 0.66 | 0.89 | 0.27  | 0.27 |
| Uniform Delay, d1      | 28.4  | 18.6 | 18.1 | 23.8 | 24.9 | 27.2  | 23.7  | 21.9 | 42.1 | 44.8 | 38.1  | 38.1 |
| Progression 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 |
| Incremental Delay, d2  | 53.2  | 0.1  | 0.1  | 3.3  | 1.5  | 7.8   | 0.5   | 0.3  | 14.4 | 13.8 | 2.0   | 2.0  |
| Delay (s)              | 81.6  | 18.7 | 18.2 | 27.1 | 26.4 | 35.0  | 24.1  | 22.1 | 56.5 | 58.6 | 40.1  | 40.1 |
| Level of Service       | F     | B    | B    | C    | C    | D     | C     | C    | E    | E    | D     | D    |
| Approach Delay (s)     |       | 25.8 |      |      | 26.5 |       | 27.4  |      |      | 55.6 |       |      |
| Approach LOS           |       | C    |      |      | C    |       | C     |      |      | E    |       |      |

| Intersection Summary              |       |                           |
|-----------------------------------|-------|---------------------------|
| HCM Average Control Delay         | 33.9  | HCM Level of Service C    |
| HCM Volume to Capacity ratio      | 0.85  |                           |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) 16.0 |
| Intersection Capacity Utilization | 99.7% | ICU Level of Service F    |
| Analysis Period (min)             | 15    |                           |
| c Critical Lane Group             |       |                           |

HCM Signalized Intersection Capacity Analysis  
 11: Winchester Road W & Ferguson Avenue

2016 Condition - Alt. 1  
 PM Peak Hour



| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL    | NBT  | NBR    | SBL  | SBT  | SBR  |
|------------------------|------|-------|------|-------|------|------|--------|------|--------|------|------|------|
| Lane Configurations    |      |       |      |       |      |      |        |      |        |      |      |      |
| Volume (vph)           | 29   | 1331  | 244  | 149   | 602  | 106  | 300    | 0    | 154    | 18   | 0    | 19   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900   | 1900 | 1900   | 1900 | 1900 | 1900 |
| Total Lost time (s)    | 6.0  | 6.0   | 6.0  | 5.0   | 5.5  |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Lane Util. Factor      | 1.00 | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frbp, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frt                    | 1.00 | 1.00  | 0.85 | 1.00  | 0.98 |      | 1.00   |      | 0.85   |      | 0.93 |      |
| Flt Protected          | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95   |      | 1.00   |      | 0.98 |      |
| Satd. Flow (prot)      | 1822 | 3544  | 1601 | 1789  | 3405 |      | 1789   |      | 1601   |      | 1606 |      |
| Flt Permitted          | 0.36 | 1.00  | 1.00 | 0.09  | 1.00 |      | 0.73   |      | 1.00   |      | 0.98 |      |
| Satd. Flow (perm)      | 691  | 3544  | 1601 | 166   | 3405 |      | 1376   |      | 1601   |      | 1606 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92   | 0.92 | 0.92   | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)        | 32   | 1447  | 265  | 162   | 654  | 115  | 326    | 0    | 167    | 20   | 0    | 21   |
| RTOR Reduction (vph)   | 0    | 0     | 105  | 0     | 16   | 0    | 0      | 0    | 122    | 0    | 15   | 0    |
| Lane Group Flow (vph)  | 32   | 1447  | 160  | 162   | 753  | 0    | 326    | 0    | 45     | 0    | 26   | 0    |
| Confl. Peds. (#/hr)    | 2    |       |      |       |      | 2    |        |      |        |      |      |      |
| Heavy Vehicles (%)     | 0%   | 3%    | 2%   | 2%    | 5%   | 1%   | 2%     | 2%   | 2%     | 0%   | 2%   | 17%  |
| Turn Type              | Perm |       | Perm | pm+pt |      |      | custom |      | custom |      | Perm |      |
| Protected Phases       |      | 4     |      | 3     | 8    |      |        |      |        |      |      | 6    |
| Permitted Phases       | 4    |       | 4    | 8     |      |      | 2      |      | 2      | 6    |      |      |
| Actuated Green, G (s)  | 40.0 | 40.0  | 40.0 | 52.5  | 52.5 |      | 23.3   |      | 23.3   |      | 23.3 |      |
| Effective Green, g (s) | 40.0 | 40.0  | 40.0 | 52.5  | 52.5 |      | 23.3   |      | 23.3   |      | 23.3 |      |
| Actuated g/C Ratio     | 0.46 | 0.46  | 0.46 | 0.60  | 0.60 |      | 0.27   |      | 0.27   |      | 0.27 |      |
| Clearance Time (s)     | 6.0  | 6.0   | 6.0  | 5.0   | 5.5  |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0    |      | 3.0    |      | 3.0  |      |
| Lane Grp Cap (vph)     | 317  | 1624  | 734  | 230   | 2048 |      | 367    |      | 427    |      | 429  |      |
| v/s Ratio Prot         |      | c0.41 |      | c0.06 | 0.22 |      |        |      |        |      |      |      |
| v/s Ratio Perm         | 0.05 |       | 0.10 | 0.37  |      |      | c0.24  |      | 0.03   |      | 0.02 |      |
| v/c Ratio              | 0.10 | 0.89  | 0.22 | 0.70  | 0.37 |      | 0.89   |      | 0.10   |      | 0.06 |      |
| Uniform Delay, d1      | 13.4 | 21.7  | 14.2 | 16.3  | 8.9  |      | 30.7   |      | 24.1   |      | 23.8 |      |
| Progression Factor     | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Incremental Delay, d2  | 0.1  | 6.6   | 0.2  | 9.4   | 0.1  |      | 21.9   |      | 0.1    |      | 0.1  |      |
| Delay (s)              | 13.6 | 28.2  | 14.4 | 25.7  | 9.0  |      | 52.7   |      | 24.2   |      | 23.9 |      |
| Level of Service       | B    | C     | B    | C     | A    |      | D      |      | C      |      | C    |      |
| Approach Delay (s)     |      | 25.9  |      |       | 11.9 |      |        | 43.1 |        |      | 23.9 |      |
| Approach LOS           |      | C     |      |       | B    |      |        | D    |        |      | C    |      |

| Intersection Summary              |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 24.4  | HCM Level of Service | C    |
| HCM Volume to Capacity ratio      | 0.87  |                      |      |
| Actuated Cycle Length (s)         | 87.3  | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 80.8% | ICU Level of Service | D    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
6: Campbell Street & Baldwin Street N

2016 Condition - Alt. 1  
PM Peak Hour



| Movement               | EBL  | EBR   | NBL   | NBT   | SBT  | SBR  |
|------------------------|------|-------|-------|-------|------|------|
| Lane Configurations    |      |       |       |       |      |      |
| Volume (vph)           | 15   | 257   | 237   | 780   | 611  | 24   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 6.0  | 6.0   | 4.0   | 6.0   | 6.0  |      |
| Lane Util. Factor      | 1.00 | 1.00  | 0.95  | 0.95  | 1.00 |      |
| Frbp, ped/bikes        | 1.00 | 0.90  | 1.00  | 1.00  | 1.00 |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |      |
| Frt                    | 1.00 | 0.85  | 1.00  | 1.00  | 0.99 |      |
| Flt Protected          | 0.95 | 1.00  | 0.95  | 1.00  | 1.00 |      |
| Satd. Flow (prot)      | 1825 | 1459  | 1717  | 1754  | 1836 |      |
| Flt Permitted          | 0.95 | 1.00  | 0.24  | 0.98  | 1.00 |      |
| Satd. Flow (perm)      | 1825 | 1459  | 431   | 1715  | 1836 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92  | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 16   | 279   | 258   | 848   | 664  | 26   |
| RTOR Reduction (vph)   | 0    | 248   | 0     | 0     | 1    | 0    |
| Lane Group Flow (vph)  | 16   | 31    | 232   | 874   | 689  | 0    |
| Confl. Peds. (#/hr)    | 1    | 35    | 13    |       |      | 13   |
| Heavy Vehicles (%)     | 0%   | 1%    | 1%    | 4%    | 4%   | 1%   |
| Turn Type              |      | Perm  | pm+pt |       |      |      |
| Protected Phases       | 4    |       | 5     | 2     | 6    |      |
| Permitted Phases       |      | 4     | 2     |       |      |      |
| Actuated Green, G (s)  | 8.0  | 8.0   | 52.1  | 52.1  | 40.0 |      |
| Effective Green, g (s) | 8.0  | 8.0   | 52.1  | 52.1  | 40.0 |      |
| Actuated g/C Ratio     | 0.11 | 0.11  | 0.72  | 0.72  | 0.55 |      |
| Clearance Time (s)     | 6.0  | 6.0   | 4.0   | 6.0   | 6.0  |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0   | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)     | 202  | 162   | 456   | 1244  | 1019 |      |
| v/s Ratio Prot         | 0.01 |       | 0.06  | c0.08 | 0.37 |      |
| v/s Ratio Perm         |      | c0.02 | 0.31  | c0.43 |      |      |
| v/c Ratio              | 0.08 | 0.19  | 0.51  | 0.70  | 0.68 |      |
| Uniform Delay, d1      | 28.7 | 29.1  | 6.5   | 5.6   | 11.4 |      |
| Progression Factor     | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |      |
| Incremental Delay, d2  | 0.2  | 0.6   | 0.9   | 1.8   | 3.6  |      |
| Delay (s)              | 28.9 | 29.7  | 7.4   | 7.5   | 15.0 |      |
| Level of Service       | C    | C     | A     | A     | B    |      |
| Approach Delay (s)     | 29.6 |       |       | 7.4   | 15.0 |      |
| Approach LOS           | C    |       |       | A     | B    |      |

| Intersection Summary              |  |       |                           |
|-----------------------------------|--|-------|---------------------------|
| HCM Average Control Delay         |  | 13.1  | HCM Level of Service B    |
| HCM Volume to Capacity ratio      |  | 0.63  |                           |
| Actuated Cycle Length (s)         |  | 72.1  | Sum of lost time (s) 12.0 |
| Intersection Capacity Utilization |  | 99.9% | ICU Level of Service F    |
| Analysis Period (min)             |  | 15    |                           |
| c Critical Lane Group             |  |       |                           |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 1  
PM Peak Hour



| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT   | NBR  | SBL   | SBT  | SBR  |
|------------------------|------|-------|------|-------|------|------|-------|-------|------|-------|------|------|
| Lane Configurations    |      |       |      |       |      |      |       |       |      |       |      |      |
| Volume (vph)           | 137  | 1214  | 384  | 211   | 547  | 45   | 219   | 830   | 391  | 92    | 619  | 71   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0   |      | 7.0   | 7.0  | 7.0  |
| Lane Util. Factor      | 1.00 | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00  | 0.95  |      | 1.00  | 0.95 | 1.00 |
| Frbp, ped/bikes        | 1.00 | 1.00  | 0.99 | 1.00  | 1.00 |      | 1.00  | 0.99  |      | 1.00  | 1.00 | 0.98 |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Frt                    | 1.00 | 1.00  | 0.85 | 1.00  | 0.99 |      | 1.00  | 0.95  |      | 1.00  | 1.00 | 0.85 |
| Flt Protected          | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95  | 1.00  |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1823 | 3579  | 1520 | 1807  | 3497 |      | 1772  | 3379  |      | 1825  | 3614 | 1546 |
| Flt Permitted          | 0.41 | 1.00  | 1.00 | 0.09  | 1.00 |      | 0.25  | 1.00  |      | 0.11  | 1.00 | 1.00 |
| Satd. Flow (perm)      | 781  | 3579  | 1520 | 162   | 3497 |      | 460   | 3379  |      | 202   | 3614 | 1546 |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 149  | 1320  | 417  | 229   | 595  | 49   | 238   | 902   | 425  | 100   | 673  | 77   |
| RTOR Reduction (vph)   | 0    | 0     | 126  | 0     | 5    | 0    | 0     | 47    | 0    | 0     | 0    | 53   |
| Lane Group Flow (vph)  | 149  | 1320  | 291  | 229   | 639  | 0    | 238   | 1280  | 0    | 100   | 673  | 24   |
| Confl. Peds. (#/hr)    | 1    |       | 1    | 1     |      | 1    | 2     |       | 21   | 21    |      | 2    |
| Heavy Vehicles (%)     | 0%   | 2%    | 6%   | 1%    | 3%   | 3%   | 3%    | 1%    | 2%   | 0%    | 1%   | 4%   |
| Turn Type              | Perm |       | Perm | pm+pt |      |      | pm+pt |       |      | Perm  |      | Perm |
| Protected Phases       |      | 4     |      | 3     | 8    |      | 5     | 2     |      |       | 6    |      |
| Permitted Phases       | 4    |       | 4    | 8     |      |      | 2     |       |      | 6     |      | 6    |
| Actuated Green, G (s)  | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0  |      | 38.0  | 38.0 | 38.0 |
| Effective Green, g (s) | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0  |      | 38.0  | 38.0 | 38.0 |
| Actuated g/C Ratio     | 0.38 | 0.38  | 0.38 | 0.49  | 0.49 |      | 0.39  | 0.39  |      | 0.32  | 0.32 | 0.32 |
| Clearance Time (s)     | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0   |      | 7.0   | 7.0  | 7.0  |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0   | 3.0   |      | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 293  | 1342  | 570  | 244   | 1719 |      | 257   | 1323  |      | 64    | 1144 | 490  |
| v/s Ratio Prot         |      | c0.37 |      | c0.09 | 0.18 |      | 0.05  | c0.38 |      |       | 0.19 |      |
| v/s Ratio Perm         | 0.19 |       | 0.19 | 0.37  |      |      | 0.31  |       |      | c0.49 |      | 0.02 |
| v/c Ratio              | 0.51 | 0.98  | 0.51 | 0.94  | 0.37 |      | 0.93  | 0.97  |      | 1.56  | 0.59 | 0.05 |
| Uniform Delay, d1      | 29.0 | 37.1  | 29.0 | 34.4  | 19.0 |      | 33.3  | 35.8  |      | 41.0  | 34.4 | 28.5 |
| Progression Factor     | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2  | 1.4  | 20.6  | 0.8  | 40.6  | 0.1  |      | 36.5  | 18.1  |      | 315.8 | 2.2  | 0.2  |
| Delay (s)              | 30.3 | 57.7  | 29.8 | 75.0  | 19.1 |      | 69.8  | 53.9  |      | 356.8 | 36.7 | 28.7 |
| Level of Service       | C    | E     | C    | E     | B    |      | E     | D     |      | F     | D    | C    |
| Approach Delay (s)     |      | 49.4  |      |       | 33.8 |      |       | 56.3  |      |       | 73.6 |      |
| Approach LOS           |      | D     |      |       | C    |      |       | E     |      |       | E    |      |

| Intersection Summary              |        |                      |      |
|-----------------------------------|--------|----------------------|------|
| HCM Average Control Delay         | 52.8   | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 1.24   |                      |      |
| Actuated Cycle Length (s)         | 120.0  | Sum of lost time (s) | 23.0 |
| Intersection Capacity Utilization | 107.3% | ICU Level of Service | G    |
| Analysis Period (min)             | 15     |                      |      |
| c Critical Lane Group             |        |                      |      |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 1  
PM Peak Hour



| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT  | NBR  | SBL   | SBT  | SBR  |
|------------------------|------|-------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations    |      |       |      |       |      |      |       |      |      |       |      |      |
| Volume (vph)           | 137  | 1214  | 384  | 211   | 547  | 45   | 219   | 830  | 391  | 92    | 619  | 71   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0  | 7.0  | 7.0   | 7.0  | 7.0  |
| Lane Util. Factor      | 1.00 | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00  | 0.95 | 1.00 | 1.00  | 0.95 | 1.00 |
| Frbp, ped/bikes        | 1.00 | 1.00  | 0.99 | 1.00  | 1.00 |      | 1.00  | 1.00 | 0.95 | 1.00  | 1.00 | 0.98 |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 | 0.99  | 1.00 | 1.00 |
| Frt                    | 1.00 | 1.00  | 0.85 | 1.00  | 0.99 |      | 1.00  | 1.00 | 0.85 | 1.00  | 1.00 | 0.85 |
| Flt Protected          | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95  | 1.00 | 1.00 | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1823 | 3579  | 1520 | 1807  | 3497 |      | 1772  | 3614 | 1528 | 1811  | 3614 | 1546 |
| Flt Permitted          | 0.41 | 1.00  | 1.00 | 0.09  | 1.00 |      | 0.25  | 1.00 | 1.00 | 0.23  | 1.00 | 1.00 |
| Satd. Flow (perm)      | 781  | 3579  | 1520 | 162   | 3497 |      | 460   | 3614 | 1528 | 441   | 3614 | 1546 |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 149  | 1320  | 417  | 229   | 595  | 49   | 238   | 902  | 425  | 100   | 673  | 77   |
| RTOR Reduction (vph)   | 0    | 0     | 126  | 0     | 5    | 0    | 0     | 0    | 144  | 0     | 0    | 53   |
| Lane Group Flow (vph)  | 149  | 1320  | 291  | 229   | 639  | 0    | 238   | 902  | 281  | 100   | 673  | 24   |
| Confl. Peds. (#/hr)    | 1    |       | 1    | 1     |      | 1    | 2     |      | 21   | 21    |      | 2    |
| Heavy Vehicles (%)     | 0%   | 2%    | 6%   | 1%    | 3%   | 3%   | 3%    | 1%   | 2%   | 0%    | 1%   | 4%   |
| Turn Type              | Perm |       | Perm | pm+pt |      |      | pm+pt |      | Perm | Perm  |      | Perm |
| Protected Phases       |      | 4     |      | 3     | 8    |      | 5     | 2    |      |       | 6    |      |
| Permitted Phases       | 4    |       | 4    | 8     |      |      | 2     |      | 2    | 6     |      | 6    |
| Actuated Green, G (s)  | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0 | 47.0 | 38.0  | 38.0 | 38.0 |
| Effective Green, g (s) | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0 | 47.0 | 38.0  | 38.0 | 38.0 |
| Actuated g/C Ratio     | 0.38 | 0.38  | 0.38 | 0.49  | 0.49 |      | 0.39  | 0.39 | 0.39 | 0.32  | 0.32 | 0.32 |
| Clearance Time (s)     | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0  | 7.0  | 7.0   | 7.0  | 7.0  |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 293  | 1342  | 570  | 244   | 1719 |      | 257   | 1415 | 598  | 140   | 1144 | 490  |
| v/s Ratio Prot         |      | c0.37 |      | c0.09 | 0.18 |      | c0.05 | 0.25 |      |       | 0.19 |      |
| v/s Ratio Perm         | 0.19 |       | 0.19 | 0.37  |      |      | 0.31  |      | 0.18 | c0.23 |      | 0.02 |
| v/c Ratio              | 0.51 | 0.98  | 0.51 | 0.94  | 0.37 |      | 0.93  | 0.64 | 0.47 | 0.71  | 0.59 | 0.05 |
| Uniform Delay, d1      | 29.0 | 37.1  | 29.0 | 34.4  | 19.0 |      | 33.3  | 29.6 | 27.2 | 36.2  | 34.4 | 28.5 |
| Progression Factor     | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2  | 1.4  | 20.6  | 0.8  | 40.6  | 0.1  |      | 36.5  | 2.2  | 2.6  | 26.6  | 2.2  | 0.2  |
| Delay (s)              | 30.3 | 57.7  | 29.8 | 75.0  | 19.1 |      | 69.8  | 31.8 | 29.9 | 62.8  | 36.7 | 28.7 |
| Level of Service       | C    | E     | C    | E     | B    |      | E     | C    | C    | E     | D    | C    |
| Approach Delay (s)     |      | 49.4  |      |       | 33.8 |      |       | 37.0 |      |       | 39.0 |      |
| Approach LOS           |      | D     |      |       | C    |      |       | D    |      |       | D    |      |

| Intersection Summary              |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 41.3  | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 0.87  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 94.1% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
 11: Winchester Road W & Ferguson Avenue

2016 Condition - Alt. 2  
 AM Peak Hour



| Movement               | EBL  | EBT  | EBR  | WBL  | WBT   | WBR  | NBL    | NBT  | NBR    | SBL  | SBT  | SBR  |
|------------------------|------|------|------|------|-------|------|--------|------|--------|------|------|------|
| Lane Configurations    |      | ↑↑   | ↑    | ↑    | ↑↑    |      | ↑      |      | ↑      |      | ↑↓   |      |
| Volume (vph)           | 0    | 703  | 246  | 137  | 952   | 28   | 112    | 0    | 38     | 0    | 0    | 32   |
| Ideal Flow (vphpl)     | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900   | 1900 | 1900   | 1900 | 1900 | 1900 |
| Total Lost time (s)    |      | 6.0  | 6.0  | 6.0  | 6.0   |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Lane Util. Factor      |      | 0.91 | 0.91 | 1.00 | 0.95  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frbp, ped/bikes        |      | 1.00 | 1.00 | 1.00 | 1.00  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Flpb, ped/bikes        |      | 1.00 | 1.00 | 1.00 | 1.00  |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frt                    |      | 0.99 | 0.85 | 1.00 | 1.00  |      | 1.00   |      | 0.85   |      | 0.86 |      |
| Flt Protected          |      | 1.00 | 1.00 | 0.95 | 1.00  |      | 0.95   |      | 1.00   |      | 1.00 |      |
| Satd. Flow (prot)      |      | 3142 | 1457 | 1789 | 3423  |      | 1789   |      | 1601   |      | 1662 |      |
| Flt Permitted          |      | 1.00 | 1.00 | 0.33 | 1.00  |      | 0.73   |      | 1.00   |      | 1.00 |      |
| Satd. Flow (perm)      |      | 3142 | 1457 | 616  | 3423  |      | 1383   |      | 1601   |      | 1662 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92   | 0.92 | 0.92   | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)        | 0    | 764  | 267  | 149  | 1035  | 30   | 122    | 0    | 41     | 0    | 0    | 35   |
| RTOR Reduction (vph)   | 0    | 4    | 113  | 0    | 3     | 0    | 0      | 0    | 32     | 0    | 28   | 0    |
| Lane Group Flow (vph)  | 0    | 787  | 127  | 149  | 1062  | 0    | 122    | 0    | 9      | 0    | 7    | 0    |
| Confl. Peds. (#/hr)    | 1    |      |      |      |       | 1    |        |      |        |      |      |      |
| Heavy Vehicles (%)     | 0%   | 11%  | 2%   | 2%   | 6%    | 10%  | 2%     | 2%   | 2%     | 0%   | 2%   | 0%   |
| Turn Type              |      |      | Perm | Perm |       |      | custom |      | custom |      | Perm |      |
| Protected Phases       |      | 4    |      |      | 8     |      |        |      |        |      |      | 6    |
| Permitted Phases       |      |      | 4    | 8    |       |      | 2      |      | 2      | 6    |      |      |
| Actuated Green, G (s)  |      | 24.5 | 24.5 | 24.5 | 24.5  |      | 9.9    |      | 9.9    |      | 9.9  |      |
| Effective Green, g (s) |      | 24.5 | 24.5 | 24.5 | 24.5  |      | 9.9    |      | 9.9    |      | 9.9  |      |
| Actuated g/C Ratio     |      | 0.53 | 0.53 | 0.53 | 0.53  |      | 0.21   |      | 0.21   |      | 0.21 |      |
| Clearance Time (s)     |      | 6.0  | 6.0  | 6.0  | 6.0   |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Vehicle Extension (s)  |      | 3.0  | 3.0  | 3.0  | 3.0   |      | 3.0    |      | 3.0    |      | 3.0  |      |
| Lane Grp Cap (vph)     |      | 1659 | 769  | 325  | 1807  |      | 295    |      | 342    |      | 355  |      |
| v/s Ratio Prot         |      | 0.25 |      |      | c0.31 |      |        |      |        |      |      | 0.00 |
| v/s Ratio Perm         |      |      | 0.09 | 0.24 |       |      | c0.09  |      | 0.01   |      |      |      |
| v/c Ratio              |      | 0.47 | 0.16 | 0.46 | 0.59  |      | 0.41   |      | 0.03   |      |      | 0.02 |
| Uniform Delay, d1      |      | 6.9  | 5.7  | 6.8  | 7.5   |      | 15.7   |      | 14.4   |      |      | 14.4 |
| Progression Factor     |      | 1.00 | 1.00 | 1.00 | 1.00  |      | 1.00   |      | 1.00   |      |      | 1.00 |
| Incremental Delay, d2  |      | 0.2  | 0.1  | 1.0  | 0.5   |      | 0.9    |      | 0.0    |      |      | 0.0  |
| Delay (s)              |      | 7.1  | 5.8  | 7.8  | 8.0   |      | 16.7   |      | 14.5   |      |      | 14.4 |
| Level of Service       |      | A    | A    | A    | A     |      | B      |      | B      |      |      | B    |
| Approach Delay (s)     |      | 6.8  |      |      | 8.0   |      |        | 16.1 |        |      |      | 14.4 |
| Approach LOS           |      | A    |      |      | A     |      |        | B    |        |      |      | B    |

| Intersection Summary              |       |                      |
|-----------------------------------|-------|----------------------|
| HCM Average Control Delay         | 8.1   | HCM Level of Service |
| HCM Volume to Capacity ratio      | 0.54  | A                    |
| Actuated Cycle Length (s)         | 46.4  | Sum of lost time (s) |
| Intersection Capacity Utilization | 55.8% | 12.0                 |
| Analysis Period (min)             | 15    | ICU Level of Service |
| c Critical Lane Group             |       | B                    |

HCM Signalized Intersection Capacity Analysis  
6: Campbell Street & Baldwin Street N

2016 Condition - Alt. 2  
AM Peak Hour



| Movement               | EBL  | EBR   | NBL   | NBT  | SBT   | SBR  |
|------------------------|------|-------|-------|------|-------|------|
| Lane Configurations    |      |       |       |      |       |      |
| Volume (vph)           | 5    | 326   | 164   | 392  | 666   | 34   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 |
| Total Lost time (s)    | 4.0  | 4.0   | 4.0   | 6.0  | 6.0   |      |
| Lane Util. Factor      | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Frbp, ped/bikes        | 1.00 | 0.96  | 1.00  | 1.00 | 1.00  |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Frt                    | 1.00 | 0.85  | 1.00  | 1.00 | 0.99  |      |
| Flt Protected          | 0.95 | 1.00  | 0.95  | 1.00 | 1.00  |      |
| Satd. Flow (prot)      | 1825 | 1523  | 1722  | 1830 | 1812  |      |
| Flt Permitted          | 0.95 | 1.00  | 0.18  | 1.00 | 1.00  |      |
| Satd. Flow (perm)      | 1825 | 1523  | 334   | 1830 | 1812  |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92  | 0.92 | 0.92  | 0.92 |
| Adj. Flow (vph)        | 5    | 354   | 178   | 426  | 724   | 37   |
| RTOR Reduction (vph)   | 0    | 248   | 0     | 0    | 2     | 0    |
| Lane Group Flow (vph)  | 5    | 106   | 178   | 426  | 759   | 0    |
| Confl. Peds. (#/hr)    |      | 10    | 5     |      |       | 5    |
| Heavy Vehicles (%)     | 0%   | 3%    | 6%    | 5%   | 5%    | 9%   |
| Turn Type              |      | Perm  | pm+pt |      |       |      |
| Protected Phases       | 4    |       | 5     | 2    | 6     |      |
| Permitted Phases       |      | 4     | 2     |      |       |      |
| Actuated Green, G (s)  | 9.4  | 9.4   | 44.2  | 44.2 | 34.2  |      |
| Effective Green, g (s) | 9.4  | 9.4   | 44.2  | 44.2 | 34.2  |      |
| Actuated g/C Ratio     | 0.15 | 0.15  | 0.69  | 0.69 | 0.54  |      |
| Clearance Time (s)     | 4.0  | 4.0   | 4.0   | 6.0  | 6.0   |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0   | 3.0  | 3.0   |      |
| Lane Grp Cap (vph)     | 270  | 225   | 363   | 1272 | 974   |      |
| v/s Ratio Prot         | 0.00 |       | c0.05 | 0.23 | c0.42 |      |
| v/s Ratio Perm         |      | c0.07 | 0.29  |      |       |      |
| v/c Ratio              | 0.02 | 0.47  | 0.49  | 0.33 | 0.78  |      |
| Uniform Delay, d1      | 23.2 | 24.8  | 7.4   | 3.9  | 11.7  |      |
| Progression Factor     | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Incremental Delay, d2  | 0.0  | 1.6   | 1.0   | 0.7  | 6.1   |      |
| Delay (s)              | 23.2 | 26.4  | 8.4   | 4.6  | 17.8  |      |
| Level of Service       | C    | C     | A     | A    | B     |      |
| Approach Delay (s)     | 26.3 |       |       | 5.7  | 17.8  |      |
| Approach LOS           | C    |       |       | A    | B     |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 15.3  | HCM Level of Service | B    |
| HCM Volume to Capacity ratio      | 0.69  |                      |      |
| Actuated Cycle Length (s)         | 63.6  | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 66.7% | ICU Level of Service | C    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 2  
AM Peak Hour



| Movement               | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL   | NBT  | NBR  | SBL   | SBT  | SBR  |
|------------------------|-------|------|------|------|------|------|-------|------|------|-------|------|------|
| Lane Configurations    |       |      |      |      |      |      |       |      |      |       |      |      |
| Volume (vph)           | 98    | 332  | 273  | 261  | 1087 | 29   | 230   | 348  | 114  | 171   | 668  | 137  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |      | 2.0   | 7.0  |      | 7.0   | 7.0  | 7.0  |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00 | 1.00 | 0.95 |      | 1.00  | 0.95 |      | 1.00  | 0.95 | 1.00 |
| Frbp, ped/bikes        | 1.00  | 1.00 | 0.98 | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00  | 1.00 | 0.98 |
| Flpb, ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 |
| Frt                    | 1.00  | 1.00 | 0.85 | 1.00 | 1.00 |      | 1.00  | 0.96 |      | 1.00  | 1.00 | 0.85 |
| Flt Protected          | 0.95  | 1.00 | 1.00 | 0.95 | 1.00 |      | 0.95  | 1.00 |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1722  | 3411 | 1532 | 1719 | 3560 |      | 1738  | 3339 |      | 1782  | 3579 | 1503 |
| Flt Permitted          | 0.12  | 1.00 | 1.00 | 0.53 | 1.00 |      | 0.14  | 1.00 |      | 0.47  | 1.00 | 1.00 |
| Satd. Flow (perm)      | 226   | 3411 | 1532 | 966  | 3560 |      | 249   | 3339 |      | 877   | 3579 | 1503 |
| Peak-hour factor, PHF  | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 107   | 361  | 297  | 284  | 1182 | 32   | 250   | 378  | 124  | 186   | 726  | 149  |
| RTOR Reduction (vph)   | 0     | 0    | 152  | 0    | 2    | 0    | 0     | 23   | 0    | 0     | 0    | 55   |
| Lane Group Flow (vph)  | 107   | 361  | 145  | 284  | 1212 | 0    | 250   | 479  | 0    | 186   | 726  | 94   |
| Confl. Peds. (#/hr)    | 3     |      | 2    | 2    |      | 3    | 2     |      | 5    | 5     |      | 2    |
| Heavy Vehicles (%)     | 6%    | 7%   | 5%   | 6%   | 2%   | 4%   | 5%    | 4%   | 7%   | 2%    | 2%   | 7%   |
| Turn Type              | Perm  |      | Perm | Perm |      |      | pm+pt |      |      | Perm  |      | Perm |
| Protected Phases       |       | 4    |      |      | 8    |      | 5     | 2    |      |       | 6    |      |
| Permitted Phases       | 4     |      | 4    | 8    |      | 2    |       |      |      | 6     |      | 6    |
| Actuated Green, G (s)  | 58.4  | 58.4 | 58.4 | 58.4 | 58.4 |      | 47.6  | 47.6 |      | 27.4  | 27.4 | 27.4 |
| Effective Green, g (s) | 58.4  | 58.4 | 58.4 | 58.4 | 58.4 |      | 47.6  | 47.6 |      | 27.4  | 27.4 | 27.4 |
| Actuated g/C Ratio     | 0.49  | 0.49 | 0.49 | 0.49 | 0.49 |      | 0.40  | 0.40 |      | 0.23  | 0.23 | 0.23 |
| Clearance Time (s)     | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |      | 2.0   | 7.0  |      | 7.0   | 7.0  | 7.0  |
| Vehicle Extension (s)  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  |      | 3.0   | 3.0  |      | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 110   | 1660 | 746  | 470  | 1733 |      | 325   | 1324 |      | 200   | 817  | 343  |
| v/s Ratio Prot         |       | 0.11 |      |      | 0.34 |      | c0.12 | 0.14 |      |       | 0.20 |      |
| v/s Ratio Perm         | c0.47 |      | 0.09 | 0.29 |      |      | 0.19  |      |      | c0.21 |      | 0.06 |
| v/c Ratio              | 0.97  | 0.22 | 0.19 | 0.60 | 0.70 |      | 0.77  | 0.36 |      | 0.93  | 0.89 | 0.27 |
| Uniform Delay, d1      | 30.0  | 17.7 | 17.5 | 22.4 | 24.0 |      | 28.0  | 25.5 |      | 45.4  | 44.8 | 38.1 |
| Progression Factor     | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2  | 76.7  | 0.1  | 0.1  | 2.2  | 1.3  |      | 10.5  | 0.8  |      | 47.6  | 13.8 | 2.0  |
| Delay (s)              | 106.7 | 17.7 | 17.6 | 24.6 | 25.2 |      | 38.5  | 26.3 |      | 93.0  | 58.6 | 40.1 |
| Level of Service       | F     | B    | B    | C    | C    |      | D     | C    |      | F     | E    | D    |
| Approach Delay (s)     |       | 30.1 |      |      | 25.1 |      |       | 30.3 |      |       | 62.0 |      |
| Approach LOS           |       | C    |      |      | C    |      |       | C    |      |       | E    |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 36.6  | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 0.92  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 99.7% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |



HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 2  
AM Peak Hour



| Movement               | EBL   | EBT  | EBR  | WBL  | WBT  | WBR  | NBL   | NBT  | NBR  | SBL  | SBT   | SBR  |
|------------------------|-------|------|------|------|------|------|-------|------|------|------|-------|------|
| Lane Configurations    |       |      |      |      |      |      |       |      |      |      |       |      |
| Volume (vph)           | 98    | 332  | 273  | 261  | 1087 | 29   | 230   | 348  | 114  | 171  | 668   | 137  |
| Ideal Flow (vphpl)     | 1900  | 1900 | 1900 | 1900 | 1900 | 1900 | 1900  | 1900 | 1900 | 1900 | 1900  | 1900 |
| Total Lost time (s)    | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |      | 2.0   | 7.0  | 7.0  | 7.0  | 7.0   | 7.0  |
| Lane Util. Factor      | 1.00  | 0.95 | 1.00 | 1.00 | 0.95 |      | 1.00  | 0.95 | 1.00 | 1.00 | 0.95  | 1.00 |
| Frbp, ped/bikes        | 1.00  | 1.00 | 0.98 | 1.00 | 1.00 |      | 1.00  | 1.00 | 0.98 | 1.00 | 1.00  | 0.98 |
| Flpb, ped/bikes        | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Frt                    | 1.00  | 1.00 | 0.85 | 1.00 | 1.00 |      | 1.00  | 1.00 | 0.85 | 1.00 | 1.00  | 0.85 |
| Flt Protected          | 0.95  | 1.00 | 1.00 | 0.95 | 1.00 |      | 0.95  | 1.00 | 1.00 | 0.95 | 1.00  | 1.00 |
| Satd. Flow (prot)      | 1722  | 3411 | 1532 | 1719 | 3560 |      | 1738  | 3510 | 1496 | 1781 | 3579  | 1503 |
| Flt Permitted          | 0.12  | 1.00 | 1.00 | 0.53 | 1.00 |      | 0.14  | 1.00 | 1.00 | 0.53 | 1.00  | 1.00 |
| Satd. Flow (perm)      | 226   | 3411 | 1532 | 966  | 3560 |      | 249   | 3510 | 1496 | 989  | 3579  | 1503 |
| Peak-hour factor, PHF  | 0.92  | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92 | 0.92  | 0.92 |
| Adj. Flow (vph)        | 107   | 361  | 297  | 284  | 1182 | 32   | 250   | 378  | 124  | 186  | 726   | 149  |
| RTOR Reduction (vph)   | 0     | 0    | 152  | 0    | 2    | 0    | 0     | 0    | 75   | 0    | 0     | 55   |
| Lane Group Flow (vph)  | 107   | 361  | 145  | 284  | 1212 | 0    | 250   | 378  | 49   | 186  | 726   | 94   |
| Confl. Peds. (#/hr)    | 3     |      | 2    | 2    |      | 3    | 2     |      | 5    | 5    |       | 2    |
| Heavy Vehicles (%)     | 6%    | 7%   | 5%   | 6%   | 2%   | 4%   | 5%    | 4%   | 7%   | 2%   | 2%    | 7%   |
| Turn Type              | Perm  |      | Perm | Perm |      |      | pm+pt |      | Perm | Perm |       | Perm |
| Protected Phases       |       | 4    |      |      | 8    |      | 5     | 2    |      |      | 6     |      |
| Permitted Phases       | 4     |      | 4    | 8    |      |      | 2     |      | 2    | 6    |       | 6    |
| Actuated Green, G (s)  | 58.4  | 58.4 | 58.4 | 58.4 | 58.4 |      | 47.6  | 47.6 | 47.6 | 27.4 | 27.4  | 27.4 |
| Effective Green, g (s) | 58.4  | 58.4 | 58.4 | 58.4 | 58.4 |      | 47.6  | 47.6 | 47.6 | 27.4 | 27.4  | 27.4 |
| Actuated g/C Ratio     | 0.49  | 0.49 | 0.49 | 0.49 | 0.49 |      | 0.40  | 0.40 | 0.40 | 0.23 | 0.23  | 0.23 |
| Clearance Time (s)     | 7.0   | 7.0  | 7.0  | 7.0  | 7.0  |      | 2.0   | 7.0  | 7.0  | 7.0  | 7.0   | 7.0  |
| Vehicle Extension (s)  | 3.0   | 3.0  | 3.0  | 3.0  | 3.0  |      | 3.0   | 3.0  | 3.0  | 3.0  | 3.0   | 3.0  |
| Lane Grp Cap (vph)     | 110   | 1660 | 746  | 470  | 1733 |      | 325   | 1392 | 593  | 226  | 817   | 343  |
| v/s Ratio Prot         |       | 0.11 |      |      | 0.34 |      | c0.12 | 0.11 |      |      | c0.20 |      |
| v/s Ratio Perm         | c0.47 |      | 0.09 | 0.29 |      |      | 0.19  |      | 0.03 | 0.19 |       | 0.06 |
| v/c Ratio              | 0.97  | 0.22 | 0.19 | 0.60 | 0.70 |      | 0.77  | 0.27 | 0.08 | 0.82 | 0.89  | 0.27 |
| Uniform Delay, d1      | 30.0  | 17.7 | 17.5 | 22.4 | 24.0 |      | 28.0  | 24.5 | 22.6 | 44.0 | 44.8  | 38.1 |
| Progression Factor     | 1.00  | 1.00 | 1.00 | 1.00 | 1.00 |      | 1.00  | 1.00 | 1.00 | 1.00 | 1.00  | 1.00 |
| Incremental Delay, d2  | 76.7  | 0.1  | 0.1  | 2.2  | 1.3  |      | 10.5  | 0.5  | 0.3  | 27.5 | 13.8  | 2.0  |
| Delay (s)              | 106.7 | 17.7 | 17.6 | 24.6 | 25.2 |      | 38.5  | 25.0 | 22.9 | 71.5 | 58.6  | 40.1 |
| Level of Service       | F     | B    | B    | C    | C    |      | D     | C    | C    | E    | E     | D    |
| Approach Delay (s)     |       | 30.1 |      |      | 25.1 |      |       | 29.1 |      |      | 58.3  |      |
| Approach LOS           |       | C    |      |      | C    |      |       | C    |      |      | E     |      |

| Intersection Summary              |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 35.4  | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 0.91  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 99.7% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
 11: Winchester Road W & Ferguson Avenue

2016 Condition - Alt. 2  
 PM Peak Hour



| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL    | NBT  | NBR    | SBL  | SBT  | SBR  |
|------------------------|------|-------|------|-------|------|------|--------|------|--------|------|------|------|
| Lane Configurations    |      | ↑↑    | ↗    | ↘     | ↑↑   |      | ↗      |      | ↗      |      | ↕    |      |
| Volume (vph)           | 0    | 1360  | 244  | 149   | 602  | 106  | 300    | 0    | 154    | 0    | 0    | 19   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900   | 1900 | 1900   | 1900 | 1900 | 1900 |
| Total Lost time (s)    |      | 6.0   | 6.0  | 5.0   | 5.5  |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Lane Util. Factor      |      | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frbp, ped/bikes        |      | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Flpb, ped/bikes        |      | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Frt                    |      | 1.00  | 0.85 | 1.00  | 0.98 |      | 1.00   |      | 0.85   |      | 0.86 |      |
| Flt Protected          |      | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95   |      | 1.00   |      | 1.00 |      |
| Satd. Flow (prot)      |      | 3544  | 1601 | 1789  | 3405 |      | 1789   |      | 1601   |      | 1420 |      |
| Flt Permitted          |      | 1.00  | 1.00 | 0.09  | 1.00 |      | 0.74   |      | 1.00   |      | 1.00 |      |
| Satd. Flow (perm)      |      | 3544  | 1601 | 164   | 3405 |      | 1401   |      | 1601   |      | 1420 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92   | 0.92 | 0.92   | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)        | 0    | 1478  | 265  | 162   | 654  | 115  | 326    | 0    | 167    | 0    | 0    | 21   |
| RTOR Reduction (vph)   | 0    | 0     | 102  | 0     | 15   | 0    | 0      | 0    | 123    | 0    | 15   | 0    |
| Lane Group Flow (vph)  | 0    | 1478  | 163  | 162   | 754  | 0    | 326    | 0    | 44     | 0    | 6    | 0    |
| Confl. Peds. (#/hr)    | 2    |       |      |       |      | 2    |        |      |        |      |      |      |
| Heavy Vehicles (%)     | 0%   | 3%    | 2%   | 2%    | 5%   | 1%   | 2%     | 2%   | 2%     | 0%   | 2%   | 17%  |
| Turn Type              |      |       | Perm | pm+pt |      |      | custom |      | custom |      | Perm |      |
| Protected Phases       |      | 4     |      | 3     | 8    |      |        |      |        |      |      | 6    |
| Permitted Phases       |      |       | 4    | 8     |      |      | 2      |      | 2      |      | 6    |      |
| Actuated Green, G (s)  |      | 40.3  | 40.3 | 52.8  | 52.8 |      | 23.0   |      | 23.0   |      | 23.0 |      |
| Effective Green, g (s) |      | 40.3  | 40.3 | 52.8  | 52.8 |      | 23.0   |      | 23.0   |      | 23.0 |      |
| Actuated g/C Ratio     |      | 0.46  | 0.46 | 0.60  | 0.60 |      | 0.26   |      | 0.26   |      | 0.26 |      |
| Clearance Time (s)     |      | 6.0   | 6.0  | 5.0   | 5.5  |      | 6.0    |      | 6.0    |      | 6.0  |      |
| Vehicle Extension (s)  |      | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0    |      | 3.0    |      | 3.0  |      |
| Lane Grp Cap (vph)     |      | 1636  | 739  | 229   | 2059 |      | 369    |      | 422    |      | 374  |      |
| v/s Ratio Prot         |      | c0.42 |      | c0.06 | 0.22 |      |        |      |        |      | 0.00 |      |
| v/s Ratio Perm         |      |       | 0.10 | 0.37  |      |      | c0.23  |      | 0.03   |      |      |      |
| v/c Ratio              |      | 0.90  | 0.22 | 0.71  | 0.37 |      | 0.88   |      | 0.10   |      | 0.01 |      |
| Uniform Delay, d1      |      | 21.7  | 14.1 | 16.6  | 8.8  |      | 30.9   |      | 24.3   |      | 23.8 |      |
| Progression Factor     |      | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00   |      | 1.00   |      | 1.00 |      |
| Incremental Delay, d2  |      | 7.4   | 0.2  | 9.6   | 0.1  |      | 21.3   |      | 0.1    |      | 0.0  |      |
| Delay (s)              |      | 29.1  | 14.2 | 26.1  | 8.9  |      | 52.1   |      | 24.5   |      | 23.8 |      |
| Level of Service       |      | C     | B    | C     | A    |      | D      |      | C      |      | C    |      |
| Approach Delay (s)     |      | 26.8  |      |       | 11.9 |      |        | 42.8 |        |      | 23.8 |      |
| Approach LOS           |      | C     |      |       | B    |      |        | D    |        |      | C    |      |

| Intersection Summary              |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 24.9  | HCM Level of Service | C    |
| HCM Volume to Capacity ratio      | 0.88  |                      |      |
| Actuated Cycle Length (s)         | 87.3  | Sum of lost time (s) | 17.0 |
| Intersection Capacity Utilization | 81.6% | ICU Level of Service | D    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
6: Campbell Street & Baldwin Street N

2016 Condition - Alt. 2  
PM Peak Hour



| Movement               | EBL  | EBR   | NBL   | NBT   | SBT  | SBR  |
|------------------------|------|-------|-------|-------|------|------|
| Lane Configurations    |      |       |       |       |      |      |
| Volume (vph)           | 15   | 275   | 266   | 780   | 611  | 24   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 6.0  | 6.0   | 4.0   | 6.0   | 6.0  |      |
| Lane Util. Factor      | 1.00 | 1.00  | 0.95  | 0.95  | 1.00 |      |
| Frbp, ped/bikes        | 1.00 | 0.90  | 1.00  | 1.00  | 1.00 |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |      |
| Frt                    | 1.00 | 0.85  | 1.00  | 1.00  | 0.99 |      |
| Flt Protected          | 0.95 | 1.00  | 0.95  | 1.00  | 1.00 |      |
| Satd. Flow (prot)      | 1825 | 1459  | 1717  | 1754  | 1836 |      |
| Flt Permitted          | 0.95 | 1.00  | 0.23  | 0.97  | 1.00 |      |
| Satd. Flow (perm)      | 1825 | 1459  | 411   | 1710  | 1836 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92  | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 16   | 299   | 289   | 848   | 664  | 26   |
| RTOR Reduction (vph)   | 0    | 265   | 0     | 0     | 1    | 0    |
| Lane Group Flow (vph)  | 16   | 34    | 260   | 877   | 689  | 0    |
| Confl. Peds. (#/hr)    | 1    | 35    | 13    |       |      | 13   |
| Heavy Vehicles (%)     | 0%   | 1%    | 1%    | 4%    | 4%   | 1%   |
| Turn Type              |      | Perm  | pm+pt |       |      |      |
| Protected Phases       | 4    |       | 5     | 2     | 6    |      |
| Permitted Phases       |      | 4     | 2     |       |      |      |
| Actuated Green, G (s)  | 8.2  | 8.2   | 52.1  | 52.1  | 39.0 |      |
| Effective Green, g (s) | 8.2  | 8.2   | 52.1  | 52.1  | 39.0 |      |
| Actuated g/C Ratio     | 0.11 | 0.11  | 0.72  | 0.72  | 0.54 |      |
| Clearance Time (s)     | 6.0  | 6.0   | 4.0   | 6.0   | 6.0  |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0   | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)     | 207  | 165   | 461   | 1238  | 990  |      |
| v/s Ratio Prot         | 0.01 |       | 0.07  | c0.09 | 0.37 |      |
| v/s Ratio Perm         |      | c0.02 | 0.34  | c0.42 |      |      |
| v/c Ratio              | 0.08 | 0.21  | 0.56  | 0.71  | 0.70 |      |
| Uniform Delay, d1      | 28.7 | 29.1  | 7.1   | 5.8   | 12.3 |      |
| Progression Factor     | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |      |
| Incremental Delay, d2  | 0.2  | 0.6   | 1.6   | 1.9   | 4.0  |      |
| Delay (s)              | 28.8 | 29.7  | 8.7   | 7.6   | 16.3 |      |
| Level of Service       | C    | C     | A     | A     | B    |      |
| Approach Delay (s)     | 29.7 |       |       | 7.9   | 16.3 |      |
| Approach LOS           | C    |       |       | A     | B    |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 13.8  | HCM Level of Service | B    |
| HCM Volume to Capacity ratio      | 0.64  |                      |      |
| Actuated Cycle Length (s)         | 72.3  | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 99.9% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 2  
PM Peak Hour


























| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT   | NBR  | SBL   | SBT  | SBR   |
|------------------------|------|-------|------|-------|------|------|-------|-------|------|-------|------|-------|
| Lane Configurations    |      |       |      |       |      |      |       |       |      |       |      |       |
| Volume (vph)           | 166  | 1196  | 384  | 211   | 547  | 45   | 219   | 830   | 391  | 110   | 619  | 71    |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900  |
| Total Lost time (s)    | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0   |      | 7.0   | 7.0  | 4.0   |
| Lane Util. Factor      | 1.00 | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00  | 0.95  |      | 1.00  | 0.95 | 1.00  |
| Frbp, ped/bikes        | 1.00 | 1.00  | 0.99 | 1.00  | 1.00 |      | 1.00  | 0.99  |      | 1.00  | 1.00 | 0.99  |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  | 1.00 | 1.00  |
| Frt                    | 1.00 | 1.00  | 0.85 | 1.00  | 0.99 |      | 1.00  | 0.95  |      | 1.00  | 1.00 | 0.85  |
| Flt Protected          | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95  | 1.00  |      | 0.95  | 1.00 | 1.00  |
| Satd. Flow (prot)      | 1823 | 3579  | 1520 | 1807  | 3497 |      | 1772  | 3379  |      | 1825  | 3614 | 1550  |
| Flt Permitted          | 0.41 | 1.00  | 1.00 | 0.08  | 1.00 |      | 0.25  | 1.00  |      | 0.11  | 1.00 | 1.00  |
| Satd. Flow (perm)      | 781  | 3579  | 1520 | 161   | 3497 |      | 460   | 3379  |      | 202   | 3614 | 1550  |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 | 0.92  | 0.92 | 0.92  |
| Adj. Flow (vph)        | 180  | 1300  | 417  | 229   | 595  | 49   | 238   | 902   | 425  | 120   | 673  | 77    |
| RTOR Reduction (vph)   | 0    | 0     | 118  | 0     | 5    | 0    | 0     | 47    | 0    | 0     | 0    | 0     |
| Lane Group Flow (vph)  | 180  | 1300  | 299  | 229   | 639  | 0    | 238   | 1280  | 0    | 120   | 673  | 77    |
| Confl. Peds. (#/hr)    | 1    |       | 1    | 1     |      | 1    | 2     |       | 21   | 21    |      | 2     |
| Heavy Vehicles (%)     | 0%   | 2%    | 6%   | 1%    | 3%   | 3%   | 3%    | 1%    | 2%   | 0%    | 1%   | 4%    |
| Turn Type              | Perm |       | Perm | pm+pt |      |      | pm+pt |       |      | Perm  |      | Free  |
| Protected Phases       |      | 4     |      | 3     | 8    |      | 5     | 2     |      |       | 6    |       |
| Permitted Phases       | 4    |       | 4    | 8     |      |      | 2     |       |      | 6     |      | Free  |
| Actuated Green, G (s)  | 45.3 | 45.3  | 45.3 | 60.0  | 60.0 |      | 46.0  | 46.0  |      | 38.0  | 38.0 | 120.0 |
| Effective Green, g (s) | 45.3 | 45.3  | 45.3 | 60.0  | 60.0 |      | 46.0  | 46.0  |      | 38.0  | 38.0 | 120.0 |
| Actuated g/C Ratio     | 0.38 | 0.38  | 0.38 | 0.50  | 0.50 |      | 0.38  | 0.38  |      | 0.32  | 0.32 | 1.00  |
| Clearance Time (s)     | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0   |      | 7.0   | 7.0  |       |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0   | 3.0   |      | 3.0   | 3.0  |       |
| Lane Grp Cap (vph)     | 295  | 1351  | 574  | 255   | 1749 |      | 242   | 1295  |      | 64    | 1144 | 1550  |
| v/s Ratio Prot         |      | c0.36 |      | c0.10 | 0.18 |      | 0.05  | c0.38 |      |       | 0.19 |       |
| v/s Ratio Perm         | 0.23 |       | 0.20 | 0.35  |      |      | 0.33  |       |      | c0.59 |      | 0.05  |
| v/c Ratio              | 0.61 | 0.96  | 0.52 | 0.90  | 0.37 |      | 0.98  | 0.99  |      | 1.88  | 0.59 | 0.05  |
| Uniform Delay, d1      | 30.2 | 36.5  | 28.9 | 33.8  | 18.4 |      | 36.0  | 36.7  |      | 41.0  | 34.4 | 0.0   |
| Progression Factor     | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  | 1.00 | 1.00  |
| Incremental Delay, d2  | 3.7  | 16.2  | 0.9  | 30.7  | 0.1  |      | 52.9  | 22.4  |      | 446.9 | 2.2  | 0.1   |
| Delay (s)              | 33.9 | 52.8  | 29.8 | 64.5  | 18.5 |      | 88.8  | 59.2  |      | 487.9 | 36.7 | 0.1   |
| Level of Service       | C    | D     | C    | E     | B    |      | F     | E     |      | F     | D    | A     |
| Approach Delay (s)     |      | 45.9  |      |       | 30.5 |      |       | 63.7  |      |       | 95.6 |       |
| Approach LOS           |      | D     |      |       | C    |      |       | E     |      |       | F    |       |

| Intersection Summary              |        |                           |
|-----------------------------------|--------|---------------------------|
| HCM Average Control Delay         | 57.0   | HCM Level of Service E    |
| HCM Volume to Capacity ratio      | 1.35   |                           |
| Actuated Cycle Length (s)         | 120.0  | Sum of lost time (s) 23.0 |
| Intersection Capacity Utilization | 107.8% | ICU Level of Service G    |
| Analysis Period (min)             | 15     |                           |
| c Critical Lane Group             |        |                           |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 2  
PM Peak Hour

|                                   |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement                          | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL  | NBT   | NBR   | SBL   | SBT   | SBR   |
| Lane Configurations               |  |  |  |  |  |   |  |  |  |  |  |  |
| Volume (vph)                      | 166   | 1196  | 384   | 211   | 547   | 45  | 219  | 830   | 391   | 110   | 619   | 71  |
| Ideal Flow (vphpl)                | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  | 1900   | 1900  | 1900  | 1900  | 1900  | 1900  |
| Total Lost time (s)               | 7.0   | 7.0   | 7.0   | 2.0   | 7.0   |   | 2.0  | 7.0   | 7.0   | 7.0   | 7.0   | 4.0   |
| Lane Util. Factor                 | 1.00  | 0.95  | 1.00  | 1.00  | 0.95  |   | 1.00   | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  |
| Frbp, ped/bikes                   | 1.00  | 1.00  | 0.99  | 1.00  | 1.00  |   | 1.00   | 1.00  | 0.95  | 1.00  | 1.00  | 0.99  |
| Flpb, ped/bikes                   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |   | 1.00   | 1.00  | 1.00  | 0.99  | 1.00  | 1.00  |
| Frt                               | 1.00  | 1.00  | 0.85  | 1.00  | 0.99  |   | 1.00   | 1.00  | 0.85  | 1.00  | 1.00  | 0.85  |
| Flt Protected                     | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  |   | 0.95   | 1.00  | 1.00  | 0.95  | 1.00  | 1.00  |
| Satd. Flow (prot)                 | 1823  | 3579  | 1520  | 1807  | 3497  |   | 1772   | 3614  | 1528  | 1812  | 3614  | 1550  |
| Flt Permitted                     | 0.41  | 1.00  | 1.00  | 0.08  | 1.00  |   | 0.25   | 1.00  | 1.00  | 0.22  | 1.00  | 1.00  |
| Satd. Flow (perm)                 | 781   | 3579  | 1520  | 161   | 3497  |   | 460  | 3614  | 1528  | 420   | 3614  | 1550  |
| Peak-hour factor, PHF             | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92   | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  |
| Adj. Flow (vph)                   | 180   | 1300  | 417   | 229   | 595   | 49  | 238  | 902   | 425   | 120   | 673   | 77  |
| RTOR Reduction (vph)              | 0   | 0   | 118   | 0   | 5   | 0   | 0  | 0   | 155   | 0   | 0   | 0   |
| Lane Group Flow (vph)             | 180   | 1300  | 299   | 229   | 639   | 0   | 238  | 902   | 270   | 120   | 673   | 77  |
| Confl. Peds. (#/hr)               | 1   |   | 1   | 1   |   | 1   | 2  |   | 21  | 21  |   | 2   |
| Heavy Vehicles (%)                | 0%  | 2%  | 6%  | 1%  | 3%  | 3%  | 3%   | 1%  | 2%  | 0%  | 1%  | 4%  |
| Turn Type                         | Perm  |   | Perm  | pm+pt   |   |   | pm+pt  |   | Perm  | Perm  |   | Free  |
| Protected Phases                  |   | 4   |   | 3   | 8   |   | 5  | 2   |   |   | 6   |   |
| Permitted Phases                  | 4   |   | 4   | 8   |   |   | 2  |   | 2   | 6   |   | Free  |
| Actuated Green, G (s)             | 45.3  | 45.3  | 45.3  | 60.0  | 60.0  |   | 46.0   | 46.0  | 46.0  | 38.0  | 38.0  | 120.0   |
| Effective Green, g (s)            | 45.3  | 45.3  | 45.3  | 60.0  | 60.0  |   | 46.0   | 46.0  | 46.0  | 38.0  | 38.0  | 120.0   |
| Actuated g/C Ratio                | 0.38  | 0.38  | 0.38  | 0.50  | 0.50  |   | 0.38   | 0.38  | 0.38  | 0.32  | 0.32  | 1.00  |
| Clearance Time (s)                | 7.0   | 7.0   | 7.0   | 2.0   | 7.0   |   | 2.0  | 7.0   | 7.0   | 7.0   | 7.0   |   |
| Vehicle Extension (s)             | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |   | 3.0  | 3.0   | 3.0   | 3.0   | 3.0   |   |
| Lane Grp Cap (vph)                | 295   | 1351  | 574   | 255   | 1749  |   | 242  | 1385  | 586   | 133   | 1144  | 1550  |
| v/s Ratio Prot                    |   | c0.36   |   | c0.10   | 0.18  |   | c0.05  | 0.25  |   |   | 0.19  |   |
| v/s Ratio Perm                    | 0.23  |   | 0.20  | 0.35  |   |   | 0.33   |   | 0.18  | c0.29   |   | 0.05  |
| v/c Ratio                         | 0.61  | 0.96  | 0.52  | 0.90  | 0.37  |   | 0.98   | 0.65  | 0.46  | 0.90  | 0.59  | 0.05  |
| Uniform Delay, d1                 | 30.2  | 36.5  | 28.9  | 33.8  | 18.4  |   | 36.0   | 30.4  | 27.7  | 39.2  | 34.4  | 0.0   |
| Progression Factor                | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Incremental Delay, d2             | 3.7   | 16.2  | 0.9   | 30.7  | 0.1   |   | 52.9   | 2.4   | 2.6   | 55.3  | 2.2   | 0.1   |
| Delay (s)                         | 33.9  | 52.8  | 29.8  | 64.5  | 18.5  |   | 88.8   | 32.8  | 30.3  | 94.6  | 36.7  | 0.1   |
| Level of Service                  | C   | D   | C   | E   | B   |   | F  | C   | C   | F   | D   | A   |
| Approach Delay (s)                |   | 45.9  |   |   | 30.5  |   |  | 40.6  |   |   | 41.4  |   |
| Approach LOS                      |   | D   |   |   | C   |   |  | D   |   |   | D   |   |
| <b>Intersection Summary</b>       |   |   |   |   |   |   |  |   |   |   |   |   |
| HCM Average Control Delay         |   |   | 41.0  |   |   | HCM Level of Service  |  |   |   | D   |   |   |
| HCM Volume to Capacity ratio      |   |   | 0.92  |   |   |   |  |   |   |   |   |   |
| Actuated Cycle Length (s)         |   |   | 120.0   |   |   | Sum of lost time (s)  |  |   | 18.0  |   |   |   |
| Intersection Capacity Utilization |   |   | 94.6%   |   |   | ICU Level of Service  |  |   | F   |   |   |   |
| Analysis Period (min)             |   |   | 15  |   |   |   |  |   |   |   |   |   |
| c Critical Lane Group             |   |   |   |   |   |   |  |   |   |   |   |   |

HCM Signalized Intersection Capacity Analysis  
 11: Winchester Road W & Ferguson Avenue

2016 Condition - Alt. 3  
 AM Peak Hour



| Movement                          | EBL  | EBT  | EBR   | WBL  | WBT   | WBR  | NBL                  | NBT  | NBR    | SBL  | SBT  | SBR  |
|-----------------------------------|------|------|-------|------|-------|------|----------------------|------|--------|------|------|------|
| Lane Configurations               |      | ↑↑   | ↑     | ↑    | ↑↑    |      | ↑                    |      | ↑      |      |      |      |
| Volume (vph)                      | 0    | 703  | 246   | 137  | 984   | 0    | 112                  | 0    | 38     | 0    | 0    | 0    |
| Ideal Flow (vphpl)                | 1900 | 1900 | 1900  | 1900 | 1900  | 1900 | 1900                 | 1900 | 1900   | 1900 | 1900 | 1900 |
| Total Lost time (s)               |      | 6.0  | 6.0   | 6.0  | 6.0   |      | 6.0                  |      | 6.0    |      |      |      |
| Lane Util. Factor                 |      | 0.91 | 0.91  | 1.00 | 0.95  |      | 1.00                 |      | 1.00   |      |      |      |
| Frbp, ped/bikes                   |      | 1.00 | 1.00  | 1.00 | 1.00  |      | 1.00                 |      | 1.00   |      |      |      |
| Flpb, ped/bikes                   |      | 1.00 | 1.00  | 1.00 | 1.00  |      | 1.00                 |      | 1.00   |      |      |      |
| Frt                               |      | 0.99 | 0.85  | 1.00 | 1.00  |      | 1.00                 |      | 0.85   |      |      |      |
| Flt Protected                     |      | 1.00 | 1.00  | 0.95 | 1.00  |      | 0.95                 |      | 1.00   |      |      |      |
| Satd. Flow (prot)                 |      | 3142 | 1457  | 1789 | 3444  |      | 1789                 |      | 1601   |      |      |      |
| Flt Permitted                     |      | 1.00 | 1.00  | 0.33 | 1.00  |      | 0.95                 |      | 1.00   |      |      |      |
| Satd. Flow (perm)                 |      | 3142 | 1457  | 624  | 3444  |      | 1789                 |      | 1601   |      |      |      |
| Peak-hour factor, PHF             | 0.92 | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92                 | 0.92 | 0.92   | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 0    | 764  | 267   | 149  | 1070  | 0    | 122                  | 0    | 41     | 0    | 0    | 0    |
| RTOR Reduction (vph)              | 0    | 4    | 111   | 0    | 0     | 0    | 0                    | 0    | 33     | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0    | 787  | 129   | 149  | 1070  | 0    | 122                  | 0    | 8      | 0    | 0    | 0    |
| Confl. Peds. (#/hr)               | 1    |      |       |      |       | 1    |                      |      |        |      |      |      |
| Heavy Vehicles (%)                | 0%   | 11%  | 2%    | 2%   | 6%    | 10%  | 2%                   | 2%   | 2%     | 0%   | 2%   | 0%   |
| Turn Type                         |      |      | Perm  | Perm |       |      | custom               |      | custom |      |      |      |
| Protected Phases                  |      | 4    |       |      | 8     |      |                      |      |        |      |      |      |
| Permitted Phases                  |      |      | 4     | 8    |       |      | 2                    |      | 2      |      |      |      |
| Actuated Green, G (s)             |      | 24.1 | 24.1  | 24.1 | 24.1  |      | 8.9                  |      | 8.9    |      |      |      |
| Effective Green, g (s)            |      | 24.1 | 24.1  | 24.1 | 24.1  |      | 8.9                  |      | 8.9    |      |      |      |
| Actuated g/C Ratio                |      | 0.54 | 0.54  | 0.54 | 0.54  |      | 0.20                 |      | 0.20   |      |      |      |
| Clearance Time (s)                |      | 6.0  | 6.0   | 6.0  | 6.0   |      | 6.0                  |      | 6.0    |      |      |      |
| Vehicle Extension (s)             |      | 3.0  | 3.0   | 3.0  | 3.0   |      | 3.0                  |      | 3.0    |      |      |      |
| Lane Grp Cap (vph)                |      | 1683 | 780   | 334  | 1844  |      | 354                  |      | 317    |      |      |      |
| v/s Ratio Prot                    |      | 0.25 |       |      | c0.31 |      |                      |      |        |      |      |      |
| v/s Ratio Perm                    |      |      | 0.09  | 0.24 |       |      | c0.07                |      | 0.01   |      |      |      |
| v/c Ratio                         |      | 0.47 | 0.16  | 0.45 | 0.58  |      | 0.34                 |      | 0.03   |      |      |      |
| Uniform Delay, d1                 |      | 6.5  | 5.3   | 6.4  | 7.0   |      | 15.5                 |      | 14.6   |      |      |      |
| Progression Factor                |      | 1.00 | 1.00  | 1.00 | 1.00  |      | 1.00                 |      | 1.00   |      |      |      |
| Incremental Delay, d2             |      | 0.2  | 0.1   | 1.0  | 0.5   |      | 0.6                  |      | 0.0    |      |      |      |
| Delay (s)                         |      | 6.7  | 5.4   | 7.3  | 7.5   |      | 16.1                 |      | 14.6   |      |      |      |
| Level of Service                  |      | A    | A     | A    | A     |      | B                    |      | B      |      |      |      |
| Approach Delay (s)                |      | 6.4  |       |      | 7.5   |      |                      | 15.7 |        |      | 0.0  |      |
| Approach LOS                      |      | A    |       |      | A     |      |                      | B    |        |      | A    |      |
| <b>Intersection Summary</b>       |      |      |       |      |       |      |                      |      |        |      |      |      |
| HCM Average Control Delay         |      |      | 7.6   |      |       |      | HCM Level of Service |      | A      |      |      |      |
| HCM Volume to Capacity ratio      |      |      | 0.52  |      |       |      |                      |      |        |      |      |      |
| Actuated Cycle Length (s)         |      |      | 45.0  |      |       |      | Sum of lost time (s) |      | 12.0   |      |      |      |
| Intersection Capacity Utilization |      |      | 49.2% |      |       |      | ICU Level of Service |      | A      |      |      |      |
| Analysis Period (min)             |      |      | 15    |      |       |      |                      |      |        |      |      |      |
| c Critical Lane Group             |      |      |       |      |       |      |                      |      |        |      |      |      |

HCM Signalized Intersection Capacity Analysis  
6: Campbell Street & Baldwin Street N

2016 Condition - Alt. 3  
AM Peak Hour

























| Movement               | EBL  | EBR   | NBL   | NBT  | SBT   | SBR  |
|------------------------|------|-------|-------|------|-------|------|
| Lane Configurations    |      |       |       |      |       |      |
| Volume (vph)           | 5    | 358   | 192   | 392  | 666   | 34   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 |
| Total Lost time (s)    | 4.0  | 4.0   | 4.0   | 6.0  | 6.0   |      |
| Lane Util. Factor      | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Frbp, ped/bikes        | 1.00 | 0.96  | 1.00  | 1.00 | 1.00  |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Frt                    | 1.00 | 0.85  | 1.00  | 1.00 | 0.99  |      |
| Flt Protected          | 0.95 | 1.00  | 0.95  | 1.00 | 1.00  |      |
| Satd. Flow (prot)      | 1825 | 1522  | 1722  | 1830 | 1812  |      |
| Flt Permitted          | 0.95 | 1.00  | 0.18  | 1.00 | 1.00  |      |
| Satd. Flow (perm)      | 1825 | 1522  | 321   | 1830 | 1812  |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92  | 0.92 | 0.92  | 0.92 |
| Adj. Flow (vph)        | 5    | 389   | 209   | 426  | 724   | 37   |
| RTOR Reduction (vph)   | 0    | 244   | 0     | 0    | 2     | 0    |
| Lane Group Flow (vph)  | 5    | 145   | 209   | 426  | 759   | 0    |
| Confl. Peds. (#/hr)    |      | 10    | 5     |      |       | 5    |
| Heavy Vehicles (%)     | 0%   | 3%    | 6%    | 5%   | 5%    | 9%   |
| Turn Type              |      | Perm  | pm+pt |      |       |      |
| Protected Phases       | 4    |       | 5     | 2    | 6     |      |
| Permitted Phases       |      | 4     | 2     |      |       |      |
| Actuated Green, G (s)  | 10.4 | 10.4  | 44.2  | 44.2 | 34.2  |      |
| Effective Green, g (s) | 10.4 | 10.4  | 44.2  | 44.2 | 34.2  |      |
| Actuated g/C Ratio     | 0.16 | 0.16  | 0.68  | 0.68 | 0.53  |      |
| Clearance Time (s)     | 4.0  | 4.0   | 4.0   | 6.0  | 6.0   |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0   | 3.0  | 3.0   |      |
| Lane Grp Cap (vph)     | 294  | 245   | 350   | 1252 | 959   |      |
| v/s Ratio Prot         | 0.00 |       | c0.06 | 0.23 | c0.42 |      |
| v/s Ratio Perm         |      | c0.10 | 0.35  |      |       |      |
| v/c Ratio              | 0.02 | 0.59  | 0.60  | 0.34 | 0.79  |      |
| Uniform Delay, d1      | 22.8 | 25.1  | 8.2   | 4.2  | 12.3  |      |
| Progression Factor     | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  |      |
| Incremental Delay, d2  | 0.0  | 3.8   | 2.7   | 0.7  | 6.6   |      |
| Delay (s)              | 22.8 | 28.9  | 11.0  | 4.9  | 18.9  |      |
| Level of Service       | C    | C     | B     | A    | B     |      |
| Approach Delay (s)     | 28.8 |       |       | 6.9  | 18.9  |      |
| Approach LOS           | C    |       |       | A    | B     |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 16.9  | HCM Level of Service | B    |
| HCM Volume to Capacity ratio      | 0.73  |                      |      |
| Actuated Cycle Length (s)         | 64.6  | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 68.7% | ICU Level of Service | C    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 3  
AM Peak Hour

|                        |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement               | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL  | NBT   | NBR   | SBL   | SBT   | SBR   |
| Lane Configurations    |  |  |  |  |  |   |  |  |   |  |  |  |
| Volume (vph)           | 98  | 332   | 273   | 261   | 1059  | 57  | 230  | 348   | 114   | 171   | 668   | 169   |
| Ideal Flow (vphpl)     | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  | 1900   | 1900  | 1900  | 1900  | 1900  | 1900  |
| Total Lost time (s)    | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   |   | 2.0  | 7.0   |   | 7.0   | 7.0   | 7.0   |
| Lane Util. Factor      | 1.00  | 0.95  | 1.00  | 1.00  | 0.95  |   | 1.00   | 0.95  |   | 1.00  | 0.95  | 1.00  |
| Frbp, ped/bikes        | 1.00  | 1.00  | 0.98  | 1.00  | 1.00  |   | 1.00   | 1.00  |   | 1.00  | 1.00  | 0.98  |
| Flpb, ped/bikes        | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |   | 1.00   | 1.00  |   | 1.00  | 1.00  | 1.00  |
| Frt                    | 1.00  | 1.00  | 0.85  | 1.00  | 0.99  |   | 1.00   | 0.96  |   | 1.00  | 1.00  | 0.85  |
| Flt Protected          | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  |   | 0.95   | 1.00  |   | 0.95  | 1.00  | 1.00  |
| Satd. Flow (prot)      | 1722  | 3411  | 1532  | 1719  | 3543  |   | 1738   | 3339  |   | 1782  | 3579  | 1503  |
| Flt Permitted          | 0.13  | 1.00  | 1.00  | 0.53  | 1.00  |   | 0.14   | 1.00  |   | 0.47  | 1.00  | 1.00  |
| Satd. Flow (perm)      | 227   | 3411  | 1532  | 966   | 3543  |   | 249  | 3339  |   | 877   | 3579  | 1503  |
| Peak-hour factor, PHF  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92   | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  |
| Adj. Flow (vph)        | 107   | 361   | 297   | 284   | 1151  | 62  | 250  | 378   | 124   | 186   | 726   | 184   |
| RTOR Reduction (vph)   | 0   | 0   | 152   | 0   | 4   | 0   | 0  | 23  | 0   | 0   | 0   | 59  |
| Lane Group Flow (vph)  | 107   | 361   | 145   | 284   | 1209  | 0   | 250  | 479   | 0   | 186   | 726   | 125   |
| Confl. Peds. (#/hr)    | 3   |   | 2   | 2   |   | 3   | 2  |   | 5   | 5   |   | 2   |
| Heavy Vehicles (%)     | 6%  | 7%  | 5%  | 6%  | 2%  | 4%  | 5%   | 4%  | 7%  | 2%  | 2%  | 7%  |
| Turn Type              | Perm  |   | Perm  | Perm  |   |   | pm+pt  |   |   | Perm  |   | Perm  |
| Protected Phases       |   | 4   |   |   | 8   |   | 5  | 2   |   |   | 6   |   |
| Permitted Phases       | 4   |   | 4   | 8   |   | 2   |  |   |   | 6   |   | 6   |
| Actuated Green, G (s)  | 58.4  | 58.4  | 58.4  | 58.4  | 58.4  |   | 47.6   | 47.6  |   | 27.4  | 27.4  | 27.4  |
| Effective Green, g (s) | 58.4  | 58.4  | 58.4  | 58.4  | 58.4  |   | 47.6   | 47.6  |   | 27.4  | 27.4  | 27.4  |
| Actuated g/C Ratio     | 0.49  | 0.49  | 0.49  | 0.49  | 0.49  |   | 0.40   | 0.40  |   | 0.23  | 0.23  | 0.23  |
| Clearance Time (s)     | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   |   | 2.0  | 7.0   |   | 7.0   | 7.0   | 7.0   |
| Vehicle Extension (s)  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |   | 3.0  | 3.0   |   | 3.0   | 3.0   | 3.0   |
| Lane Grp Cap (vph)     | 110   | 1660  | 746   | 470   | 1724  |   | 325  | 1324  |   | 200   | 817   | 343   |
| v/s Ratio Prot         |   | 0.11  |   |   | 0.34  |   | c0.12  | 0.14  |   |   | 0.20  |   |
| v/s Ratio Perm         | c0.47   |   | 0.09  | 0.29  |   |   | 0.19   |   |   | c0.21   |   | 0.08  |
| v/c Ratio              | 0.97  | 0.22  | 0.19  | 0.60  | 0.70  |   | 0.77   | 0.36  |   | 0.93  | 0.89  | 0.37  |
| Uniform Delay, d1      | 30.0  | 17.7  | 17.5  | 22.4  | 24.0  |   | 28.0   | 25.5  |   | 45.4  | 44.8  | 39.0  |
| Progression Factor     | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |   | 1.00   | 1.00  |   | 1.00  | 1.00  | 1.00  |
| Incremental Delay, d2  | 76.7  | 0.1   | 0.1   | 2.2   | 1.3   |   | 10.5   | 0.8   |   | 47.6  | 13.8  | 3.0   |
| Delay (s)              | 106.7   | 17.7  | 17.6  | 24.6  | 25.3  |   | 38.5   | 26.3  |   | 93.0  | 58.6  | 42.0  |
| Level of Service       | F   | B   | B   | C   | C   |   | D  | C   |   | F   | E   | D   |
| Approach Delay (s)     |   | 30.1  |   |   | 25.2  |   |  | 30.3  |   |   | 61.6  |   |
| Approach LOS           |   | C   |   |   | C   |   |  | C   |   |   | E   |   |
























Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 36.8  | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 0.92  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 88.6% | ICU Level of Service | E    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |



HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 3  
AM Peak Hour

|                        |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement               | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL  | NBT   | NBR   | SBL   | SBT   | SBR   |
| Lane Configurations    |  |  |  |  |  |   |  |  |  |  |  |  |
| Volume (vph)           | 98  | 332   | 273   | 261   | 1059  | 57  | 230  | 348   | 114   | 171   | 668   | 169   |
| Ideal Flow (vphpl)     | 1900  | 1900  | 1900  | 1900  | 1900  | 1900  | 1900   | 1900  | 1900  | 1900  | 1900  | 1900  |
| Total Lost time (s)    | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   |   | 2.0  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   |
| Lane Util. Factor      | 1.00  | 0.95  | 1.00  | 1.00  | 0.95  |   | 1.00   | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  |
| Frbp, ped/bikes        | 1.00  | 1.00  | 0.98  | 1.00  | 1.00  |   | 1.00   | 1.00  | 0.98  | 1.00  | 1.00  | 0.98  |
| Flpb, ped/bikes        | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |   | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Frt                    | 1.00  | 1.00  | 0.85  | 1.00  | 0.99  |   | 1.00   | 1.00  | 0.85  | 1.00  | 1.00  | 0.85  |
| Flt Protected          | 0.95  | 1.00  | 1.00  | 0.95  | 1.00  |   | 0.95   | 1.00  | 1.00  | 0.95  | 1.00  | 1.00  |
| Satd. Flow (prot)      | 1722  | 3411  | 1532  | 1719  | 3543  |   | 1738   | 3510  | 1496  | 1781  | 3579  | 1503  |
| Flt Permitted          | 0.13  | 1.00  | 1.00  | 0.53  | 1.00  |   | 0.14   | 1.00  | 1.00  | 0.53  | 1.00  | 1.00  |
| Satd. Flow (perm)      | 227   | 3411  | 1532  | 966   | 3543  |   | 249  | 3510  | 1496  | 989   | 3579  | 1503  |
| Peak-hour factor, PHF  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  | 0.92   | 0.92  | 0.92  | 0.92  | 0.92  | 0.92  |
| Adj. Flow (vph)        | 107   | 361   | 297   | 284   | 1151  | 62  | 250  | 378   | 124   | 186   | 726   | 184   |
| RTOR Reduction (vph)   | 0   | 0   | 152   | 0   | 4   | 0   | 0  | 0   | 75  | 0   | 0   | 59  |
| Lane Group Flow (vph)  | 107   | 361   | 145   | 284   | 1209  | 0   | 250  | 378   | 49  | 186   | 726   | 125   |
| Confl. Peds. (#/hr)    | 3   |   | 2   | 2   |   | 3   | 2  |   | 5   | 5   |   | 2   |
| Heavy Vehicles (%)     | 6%  | 7%  | 5%  | 6%  | 2%  | 4%  | 5%   | 4%  | 7%  | 2%  | 2%  | 7%  |
| Turn Type              | Perm  |   | Perm  | Perm  |   | pm+pt   |  | Perm  | Perm  |   | Perm  |   |
| Protected Phases       |   | 4   |   |   | 8   |   | 5  | 2   |   |   |   | 6   |
| Permitted Phases       | 4   |   | 4   | 8   |   | 2   |  | 2   | 6   |   |   | 6   |
| Actuated Green, G (s)  | 58.4  | 58.4  | 58.4  | 58.4  | 58.4  | 47.6  | 47.6   | 47.6  | 27.4  | 27.4  | 27.4  | 27.4  |
| Effective Green, g (s) | 58.4  | 58.4  | 58.4  | 58.4  | 58.4  | 47.6  | 47.6   | 47.6  | 27.4  | 27.4  | 27.4  | 27.4  |
| Actuated g/C Ratio     | 0.49  | 0.49  | 0.49  | 0.49  | 0.49  | 0.40  | 0.40   | 0.40  | 0.23  | 0.23  | 0.23  | 0.23  |
| Clearance Time (s)     | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 2.0   | 7.0  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   |
| Vehicle Extension (s)  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   | 3.0  | 3.0   | 3.0   | 3.0   | 3.0   | 3.0   |
| Lane Grp Cap (vph)     | 110   | 1660  | 746   | 470   | 1724  |   | 325  | 1392  | 593   | 226   | 817   | 343   |
| v/s Ratio Prot         |   | 0.11  |   |   | 0.34  |   | c0.12  | 0.11  |   |   | c0.20   |   |
| v/s Ratio Perm         | c0.47   |   | 0.09  | 0.29  |   | 0.19  |  | 0.03  | 0.19  |   |   | 0.08  |
| v/c Ratio              | 0.97  | 0.22  | 0.19  | 0.60  | 0.70  | 0.77  | 0.27   | 0.08  | 0.82  | 0.89  | 0.89  | 0.37  |
| Uniform Delay, d1      | 30.0  | 17.7  | 17.5  | 22.4  | 24.0  | 28.0  | 24.5   | 22.6  | 44.0  | 44.8  | 39.0  |   |
| Progression Factor     | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  | 1.00  |   |
| Incremental Delay, d2  | 76.7  | 0.1   | 0.1   | 2.2   | 1.3   | 10.5  | 0.5  | 0.3   | 27.5  | 13.8  | 3.0   |   |
| Delay (s)              | 106.7   | 17.7  | 17.6  | 24.6  | 25.3  | 38.5  | 25.0   | 22.9  | 71.5  | 58.6  | 42.0  |   |
| Level of Service       | F   | B   | B   | C   | C   | D   | C  | C   | E   | E   | D   |   |
| Approach Delay (s)     |   | 30.1  |   |   | 25.2  |   | 29.1   |   |   | 58.0  |   |   |
| Approach LOS           |   | C   |   |   | C   |   | C  |   |   | E   |   |   |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 35.6  | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 0.91  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 16.0 |
| Intersection Capacity Utilization | 88.6% | ICU Level of Service | E    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
 11: Winchester Road W & Ferguson Avenue

2016 Condition - Alt. 3  
 PM Peak Hour



| Movement                          | EBL  | EBT   | EBR   | WBL   | WBT  | WBR  | NBL                  | NBT  | NBR    | SBL  | SBT  | SBR  |
|-----------------------------------|------|-------|-------|-------|------|------|----------------------|------|--------|------|------|------|
| Lane Configurations               |      | ↑↑    | ↑     | ↑     | ↑↑   |      | ↑                    |      | ↑      |      |      |      |
| Volume (vph)                      | 0    | 1360  | 244   | 149   | 621  | 0    | 300                  | 0    | 154    | 0    | 0    | 0    |
| Ideal Flow (vphpl)                | 1900 | 1900  | 1900  | 1900  | 1900 | 1900 | 1900                 | 1900 | 1900   | 1900 | 1900 | 1900 |
| Total Lost time (s)               |      | 6.0   | 6.0   | 5.0   | 5.5  |      | 6.0                  |      | 6.0    |      |      |      |
| Lane Util. Factor                 |      | 0.95  | 1.00  | 1.00  | 0.95 |      | 1.00                 |      | 1.00   |      |      |      |
| Frbp, ped/bikes                   |      | 1.00  | 1.00  | 1.00  | 1.00 |      | 1.00                 |      | 1.00   |      |      |      |
| Flpb, ped/bikes                   |      | 1.00  | 1.00  | 1.00  | 1.00 |      | 1.00                 |      | 1.00   |      |      |      |
| Frt                               |      | 1.00  | 0.85  | 1.00  | 1.00 |      | 1.00                 |      | 0.85   |      |      |      |
| Flt Protected                     |      | 1.00  | 1.00  | 0.95  | 1.00 |      | 0.95                 |      | 1.00   |      |      |      |
| Satd. Flow (prot)                 |      | 3544  | 1601  | 1789  | 3476 |      | 1789                 |      | 1601   |      |      |      |
| Flt Permitted                     |      | 1.00  | 1.00  | 0.09  | 1.00 |      | 0.95                 |      | 1.00   |      |      |      |
| Satd. Flow (perm)                 |      | 3544  | 1601  | 161   | 3476 |      | 1789                 |      | 1601   |      |      |      |
| Peak-hour factor, PHF             | 0.92 | 0.92  | 0.92  | 0.92  | 0.92 | 0.92 | 0.92                 | 0.92 | 0.92   | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph)                   | 0    | 1478  | 265   | 162   | 675  | 0    | 326                  | 0    | 167    | 0    | 0    | 0    |
| RTOR Reduction (vph)              | 0    | 0     | 102   | 0     | 0    | 0    | 0                    | 0    | 128    | 0    | 0    | 0    |
| Lane Group Flow (vph)             | 0    | 1478  | 163   | 162   | 675  | 0    | 326                  | 0    | 39     | 0    | 0    | 0    |
| Confl. Peds. (#/hr)               | 2    |       |       |       |      | 2    |                      |      |        |      |      |      |
| Heavy Vehicles (%)                | 0%   | 3%    | 2%    | 2%    | 5%   | 1%   | 2%                   | 2%   | 2%     | 0%   | 2%   | 17%  |
| Turn Type                         |      |       | Perm  | pm+pt |      |      | custom               |      | custom |      |      |      |
| Protected Phases                  |      | 4     |       | 3     | 8    |      |                      |      |        |      |      |      |
| Permitted Phases                  |      |       | 4     | 8     |      |      | 2                    |      | 2      |      |      |      |
| Actuated Green, G (s)             |      | 41.2  | 41.2  | 53.7  | 53.7 |      | 19.4                 |      | 19.4   |      |      |      |
| Effective Green, g (s)            |      | 41.2  | 41.2  | 53.7  | 53.7 |      | 19.4                 |      | 19.4   |      |      |      |
| Actuated g/C Ratio                |      | 0.49  | 0.49  | 0.63  | 0.63 |      | 0.23                 |      | 0.23   |      |      |      |
| Clearance Time (s)                |      | 6.0   | 6.0   | 5.0   | 5.5  |      | 6.0                  |      | 6.0    |      |      |      |
| Vehicle Extension (s)             |      | 3.0   | 3.0   | 3.0   | 3.0  |      | 3.0                  |      | 3.0    |      |      |      |
| Lane Grp Cap (vph)                |      | 1726  | 780   | 237   | 2206 |      | 410                  |      | 367    |      |      |      |
| v/s Ratio Prot                    |      | c0.42 |       | c0.06 | 0.19 |      |                      |      |        |      |      |      |
| v/s Ratio Perm                    |      |       | 0.10  | 0.38  |      |      | c0.18                |      | 0.02   |      |      |      |
| v/c Ratio                         |      | 0.86  | 0.21  | 0.68  | 0.31 |      | 0.80                 |      | 0.11   |      |      |      |
| Uniform Delay, d1                 |      | 19.1  | 12.4  | 15.1  | 7.0  |      | 30.7                 |      | 25.8   |      |      |      |
| Progression Factor                |      | 1.00  | 1.00  | 1.00  | 1.00 |      | 1.00                 |      | 1.00   |      |      |      |
| Incremental Delay, d2             |      | 4.4   | 0.1   | 7.9   | 0.1  |      | 10.2                 |      | 0.1    |      |      |      |
| Delay (s)                         |      | 23.5  | 12.5  | 23.0  | 7.1  |      | 40.9                 |      | 25.9   |      |      |      |
| Level of Service                  |      | C     | B     | C     | A    |      | D                    |      | C      |      |      |      |
| Approach Delay (s)                |      | 21.8  |       |       | 10.2 |      |                      | 35.8 |        |      | 0.0  |      |
| Approach LOS                      |      | C     |       |       | B    |      |                      | D    |        |      | A    |      |
| <b>Intersection Summary</b>       |      |       |       |       |      |      |                      |      |        |      |      |      |
| HCM Average Control Delay         |      |       | 20.9  |       |      |      | HCM Level of Service |      | C      |      |      |      |
| HCM Volume to Capacity ratio      |      |       | 0.82  |       |      |      |                      |      |        |      |      |      |
| Actuated Cycle Length (s)         |      |       | 84.6  |       |      |      | Sum of lost time (s) |      | 17.0   |      |      |      |
| Intersection Capacity Utilization |      |       | 75.0% |       |      |      | ICU Level of Service |      | D      |      |      |      |
| Analysis Period (min)             |      |       | 15    |       |      |      |                      |      |        |      |      |      |
| c Critical Lane Group             |      |       |       |       |      |      |                      |      |        |      |      |      |

HCM Signalized Intersection Capacity Analysis  
6: Campbell Street & Baldwin Street N

2016 Condition - Alt. 3  
PM Peak Hour



| Movement               | EBL  | EBR   | NBL   | NBT   | SBT  | SBR  |
|------------------------|------|-------|-------|-------|------|------|
| Lane Configurations    |      |       |       |       |      |      |
| Volume (vph)           | 15   | 294   | 372   | 780   | 611  | 24   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900  | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 6.0  | 6.0   | 4.0   | 6.0   | 6.0  |      |
| Lane Util. Factor      | 1.00 | 1.00  | 0.95  | 0.95  | 1.00 |      |
| Frbp, ped/bikes        | 1.00 | 0.90  | 1.00  | 1.00  | 1.00 |      |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |      |
| Frt                    | 1.00 | 0.85  | 1.00  | 1.00  | 0.99 |      |
| Flt Protected          | 0.95 | 1.00  | 0.95  | 1.00  | 1.00 |      |
| Satd. Flow (prot)      | 1825 | 1459  | 1717  | 1753  | 1836 |      |
| Flt Permitted          | 0.95 | 1.00  | 0.20  | 0.92  | 1.00 |      |
| Satd. Flow (perm)      | 1825 | 1459  | 359   | 1615  | 1836 |      |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92  | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 16   | 320   | 404   | 848   | 664  | 26   |
| RTOR Reduction (vph)   | 0    | 283   | 0     | 0     | 1    | 0    |
| Lane Group Flow (vph)  | 16   | 37    | 364   | 888   | 689  | 0    |
| Confl. Peds. (#/hr)    | 1    | 35    | 13    |       |      | 13   |
| Heavy Vehicles (%)     | 0%   | 1%    | 1%    | 4%    | 4%   | 1%   |
| Turn Type              |      | Perm  | pm+pt |       |      |      |
| Protected Phases       | 4    |       | 5     | 2     | 6    |      |
| Permitted Phases       |      | 4     | 2     |       |      |      |
| Actuated Green, G (s)  | 8.3  | 8.3   | 52.2  | 52.2  | 36.4 |      |
| Effective Green, g (s) | 8.3  | 8.3   | 52.2  | 52.2  | 36.4 |      |
| Actuated g/C Ratio     | 0.11 | 0.11  | 0.72  | 0.72  | 0.50 |      |
| Clearance Time (s)     | 6.0  | 6.0   | 4.0   | 6.0   | 6.0  |      |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0   | 3.0   | 3.0  |      |
| Lane Grp Cap (vph)     | 209  | 167   | 480   | 1185  | 922  |      |
| v/s Ratio Prot         | 0.01 |       | 0.12  | c0.12 | 0.37 |      |
| v/s Ratio Perm         |      | c0.03 | c0.42 | 0.42  |      |      |
| v/c Ratio              | 0.08 | 0.22  | 0.76  | 0.75  | 0.75 |      |
| Uniform Delay, d1      | 28.7 | 29.2  | 9.6   | 6.2   | 14.4 |      |
| Progression Factor     | 1.00 | 1.00  | 1.00  | 1.00  | 1.00 |      |
| Incremental Delay, d2  | 0.2  | 0.7   | 6.8   | 2.6   | 5.5  |      |
| Delay (s)              | 28.8 | 29.8  | 16.3  | 8.8   | 19.9 |      |
| Level of Service       | C    | C     | B     | A     | B    |      |
| Approach Delay (s)     | 29.8 |       |       | 11.0  | 19.9 |      |
| Approach LOS           | C    |       |       | B     | B    |      |

**Intersection Summary**

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 16.5  | HCM Level of Service | B    |
| HCM Volume to Capacity ratio      | 0.68  |                      |      |
| Actuated Cycle Length (s)         | 72.5  | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 99.9% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 3  
PM Peak Hour



| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT   | NBR  | SBL   | SBT  | SBR  |
|------------------------|------|-------|------|-------|------|------|-------|-------|------|-------|------|------|
| Lane Configurations    |      |       |      |       |      |      |       |       |      |       |      |      |
| Volume (vph)           | 166  | 1196  | 384  | 211   | 441  | 151  | 219   | 830   | 391  | 110   | 619  | 90   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900  | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0   |      | 7.0   | 7.0  | 7.0  |
| Lane Util. Factor      | 1.00 | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00  | 0.95  |      | 1.00  | 0.95 | 1.00 |
| Frbp, ped/bikes        | 1.00 | 1.00  | 0.99 | 1.00  | 0.99 |      | 1.00  | 0.99  |      | 1.00  | 1.00 | 0.98 |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Frt                    | 1.00 | 1.00  | 0.85 | 1.00  | 0.96 |      | 1.00  | 0.95  |      | 1.00  | 1.00 | 0.85 |
| Flt Protected          | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95  | 1.00  |      | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1823 | 3579  | 1520 | 1807  | 3389 |      | 1772  | 3379  |      | 1825  | 3614 | 1546 |
| Flt Permitted          | 0.41 | 1.00  | 1.00 | 0.09  | 1.00 |      | 0.25  | 1.00  |      | 0.10  | 1.00 | 1.00 |
| Satd. Flow (perm)      | 782  | 3579  | 1520 | 162   | 3389 |      | 471   | 3379  |      | 197   | 3614 | 1546 |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 180  | 1300  | 417  | 229   | 479  | 164  | 238   | 902   | 425  | 120   | 673  | 98   |
| RTOR Reduction (vph)   | 0    | 0     | 117  | 0     | 22   | 0    | 0     | 47    | 0    | 0     | 0    | 66   |
| Lane Group Flow (vph)  | 180  | 1300  | 300  | 229   | 621  | 0    | 238   | 1280  | 0    | 120   | 673  | 32   |
| Confl. Peds. (#/hr)    | 1    |       | 1    | 1     |      | 1    | 2     |       | 21   | 21    |      | 2    |
| Heavy Vehicles (%)     | 0%   | 2%    | 6%   | 1%    | 3%   | 3%   | 3%    | 1%    | 2%   | 0%    | 1%   | 4%   |
| Turn Type              | Perm |       | Perm | pm+pt |      |      | pm+pt |       |      | Perm  |      | Perm |
| Protected Phases       |      | 4     |      | 3     | 8    |      | 5     | 2     |      |       | 6    |      |
| Permitted Phases       | 4    |       | 4    | 8     |      |      | 2     |       |      | 6     |      | 6    |
| Actuated Green, G (s)  | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0  |      | 39.0  | 39.0 | 39.0 |
| Effective Green, g (s) | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0  |      | 39.0  | 39.0 | 39.0 |
| Actuated g/C Ratio     | 0.38 | 0.38  | 0.38 | 0.49  | 0.49 |      | 0.39  | 0.39  |      | 0.32  | 0.32 | 0.32 |
| Clearance Time (s)     | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0   |      | 7.0   | 7.0  | 7.0  |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0   | 3.0   |      | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 293  | 1342  | 570  | 244   | 1666 |      | 250   | 1323  |      | 64    | 1175 | 502  |
| v/s Ratio Prot         |      | c0.36 |      | c0.09 | 0.18 |      | 0.05  | c0.38 |      |       | 0.19 |      |
| v/s Ratio Perm         | 0.23 |       | 0.20 | 0.37  |      |      | 0.33  |       |      | c0.61 |      | 0.02 |
| v/c Ratio              | 0.61 | 0.97  | 0.53 | 0.94  | 0.37 |      | 0.95  | 0.97  |      | 1.88  | 0.57 | 0.06 |
| Uniform Delay, d1      | 30.5 | 36.8  | 29.2 | 34.3  | 19.0 |      | 34.9  | 35.8  |      | 40.5  | 33.6 | 27.9 |
| Progression Factor     | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00  |      | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2  | 3.8  | 17.4  | 0.9  | 40.6  | 0.1  |      | 43.6  | 18.1  |      | 446.9 | 2.0  | 0.2  |
| Delay (s)              | 34.2 | 54.2  | 30.1 | 74.8  | 19.1 |      | 78.4  | 53.9  |      | 487.4 | 35.6 | 28.2 |
| Level of Service       | C    | D     | C    | E     | B    |      | E     | D     |      | F     | D    | C    |
| Approach Delay (s)     |      | 47.0  |      |       | 33.8 |      |       | 57.6  |      |       | 95.6 |      |
| Approach LOS           |      | D     |      |       | C    |      |       | E     |      |       | F    |      |

| Intersection Summary              |        |                           |
|-----------------------------------|--------|---------------------------|
| HCM Average Control Delay         | 56.3   | HCM Level of Service E    |
| HCM Volume to Capacity ratio      | 1.37   |                           |
| Actuated Cycle Length (s)         | 120.0  | Sum of lost time (s) 23.0 |
| Intersection Capacity Utilization | 107.8% | ICU Level of Service G    |
| Analysis Period (min)             | 15     |                           |
| c Critical Lane Group             |        |                           |

HCM Signalized Intersection Capacity Analysis  
12: Winchester Road W & Baldwin Street N

2016 Condition - Alt. 3  
PM Peak Hour



| Movement               | EBL  | EBT   | EBR  | WBL   | WBT  | WBR  | NBL   | NBT  | NBR  | SBL   | SBT  | SBR  |
|------------------------|------|-------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations    |      |       |      |       |      |      |       |      |      |       |      |      |
| Volume (vph)           | 166  | 1196  | 384  | 211   | 441  | 151  | 219   | 830  | 391  | 110   | 619  | 90   |
| Ideal Flow (vphpl)     | 1900 | 1900  | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 | 1900  | 1900 | 1900 |
| Total Lost time (s)    | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0  | 7.0  | 7.0   | 7.0  | 7.0  |
| Lane Util. Factor      | 1.00 | 0.95  | 1.00 | 1.00  | 0.95 |      | 1.00  | 0.95 | 1.00 | 1.00  | 0.95 | 1.00 |
| Frbp, ped/bikes        | 1.00 | 1.00  | 0.99 | 1.00  | 0.99 |      | 1.00  | 1.00 | 0.95 | 1.00  | 1.00 | 0.98 |
| Flpb, ped/bikes        | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 | 0.99  | 1.00 | 1.00 |
| Frt                    | 1.00 | 1.00  | 0.85 | 1.00  | 0.96 |      | 1.00  | 1.00 | 0.85 | 1.00  | 1.00 | 0.85 |
| Flt Protected          | 0.95 | 1.00  | 1.00 | 0.95  | 1.00 |      | 0.95  | 1.00 | 1.00 | 0.95  | 1.00 | 1.00 |
| Satd. Flow (prot)      | 1823 | 3579  | 1520 | 1807  | 3389 |      | 1772  | 3614 | 1528 | 1812  | 3614 | 1546 |
| Flt Permitted          | 0.41 | 1.00  | 1.00 | 0.09  | 1.00 |      | 0.25  | 1.00 | 1.00 | 0.23  | 1.00 | 1.00 |
| Satd. Flow (perm)      | 782  | 3579  | 1520 | 162   | 3389 |      | 471   | 3614 | 1528 | 430   | 3614 | 1546 |
| Peak-hour factor, PHF  | 0.92 | 0.92  | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 | 0.92  | 0.92 | 0.92 |
| Adj. Flow (vph)        | 180  | 1300  | 417  | 229   | 479  | 164  | 238   | 902  | 425  | 120   | 673  | 98   |
| RTOR Reduction (vph)   | 0    | 0     | 117  | 0     | 22   | 0    | 0     | 0    | 144  | 0     | 0    | 66   |
| Lane Group Flow (vph)  | 180  | 1300  | 300  | 229   | 621  | 0    | 238   | 902  | 281  | 120   | 673  | 32   |
| Confl. Peds. (#/hr)    | 1    |       | 1    | 1     |      | 1    | 2     |      | 21   | 21    |      | 2    |
| Heavy Vehicles (%)     | 0%   | 2%    | 6%   | 1%    | 3%   | 3%   | 3%    | 1%   | 2%   | 0%    | 1%   | 4%   |
| Turn Type              | Perm |       | Perm | pm+pt |      |      | pm+pt |      | Perm | Perm  |      | Perm |
| Protected Phases       |      | 4     |      | 3     | 8    |      | 5     | 2    |      |       | 6    |      |
| Permitted Phases       | 4    |       | 4    | 8     |      |      | 2     |      | 2    | 6     |      | 6    |
| Actuated Green, G (s)  | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0 | 47.0 | 39.0  | 39.0 | 39.0 |
| Effective Green, g (s) | 45.0 | 45.0  | 45.0 | 59.0  | 59.0 |      | 47.0  | 47.0 | 47.0 | 39.0  | 39.0 | 39.0 |
| Actuated g/C Ratio     | 0.38 | 0.38  | 0.38 | 0.49  | 0.49 |      | 0.39  | 0.39 | 0.39 | 0.32  | 0.32 | 0.32 |
| Clearance Time (s)     | 7.0  | 7.0   | 7.0  | 2.0   | 7.0  |      | 2.0   | 7.0  | 7.0  | 7.0   | 7.0  | 7.0  |
| Vehicle Extension (s)  | 3.0  | 3.0   | 3.0  | 3.0   | 3.0  |      | 3.0   | 3.0  | 3.0  | 3.0   | 3.0  | 3.0  |
| Lane Grp Cap (vph)     | 293  | 1342  | 570  | 244   | 1666 |      | 250   | 1415 | 598  | 140   | 1175 | 502  |
| v/s Ratio Prot         |      | c0.36 |      | c0.09 | 0.18 |      | c0.05 | 0.25 |      |       | 0.19 |      |
| v/s Ratio Perm         | 0.23 |       | 0.20 | 0.37  |      |      | 0.33  |      | 0.18 | c0.28 |      | 0.02 |
| v/c Ratio              | 0.61 | 0.97  | 0.53 | 0.94  | 0.37 |      | 0.95  | 0.64 | 0.47 | 0.86  | 0.57 | 0.06 |
| Uniform Delay, d1      | 30.5 | 36.8  | 29.2 | 34.3  | 19.0 |      | 34.9  | 29.6 | 27.2 | 37.9  | 33.6 | 27.9 |
| Progression Factor     | 1.00 | 1.00  | 1.00 | 1.00  | 1.00 |      | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 |
| Incremental Delay, d2  | 3.8  | 17.4  | 0.9  | 40.6  | 0.1  |      | 43.6  | 2.2  | 2.6  | 45.3  | 2.0  | 0.2  |
| Delay (s)              | 34.2 | 54.2  | 30.1 | 74.8  | 19.1 |      | 78.4  | 31.8 | 29.8 | 83.2  | 35.6 | 28.2 |
| Level of Service       | C    | D     | C    | E     | B    |      | E     | C    | C    | F     | D    | C    |
| Approach Delay (s)     |      | 47.0  |      |       | 33.8 |      |       | 38.4 |      |       | 41.2 |      |
| Approach LOS           |      | D     |      |       | C    |      |       | D    |      |       | D    |      |

Intersection Summary

|                                   |       |                      |      |
|-----------------------------------|-------|----------------------|------|
| HCM Average Control Delay         | 41.2  | HCM Level of Service | D    |
| HCM Volume to Capacity ratio      | 0.91  |                      |      |
| Actuated Cycle Length (s)         | 120.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 94.6% | ICU Level of Service | F    |
| Analysis Period (min)             | 15    |                      |      |
| c Critical Lane Group             |       |                      |      |