

Appendix G:

HCM Reports
(Existing, 2016, and 2035)

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

Existing AM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|-------|------|-------|------|-------|-------|------|
| Lane Configurations | ↔ | ↔ | | | ↔ | ↔ | ↔ | ↔ | | ↔ | ↔ | ↔ |
| Volume (vph) | 5 | 5 | 10 | 40 | 10 | 90 | 5 | 465 | 30 | 80 | 530 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.90 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1676 | | | 1791 | 1583 | 1770 | 1846 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.56 | 1.00 | | | 0.76 | 1.00 | 0.47 | 1.00 | | 0.33 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1043 | 1676 | | | 1413 | 1583 | 870 | 1846 | | 609 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 10 | 40 | 10 | 90 | 5 | 465 | 30 | 80 | 530 | 20 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 |
| Lane Group Flow (vph) | 5 | 7 | 0 | 0 | 50 | 90 | 5 | 494 | 0 | 80 | 530 | 14 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 9.6 | 9.6 | | | 4.8 | 57.7 | 27.8 | 27.8 | | 38.1 | 38.1 | 38.1 |
| Effective Green, g (s) | 11.6 | 11.6 | | | 6.8 | 57.7 | 29.8 | 29.8 | | 40.1 | 40.1 | 40.1 |
| Actuated g/C Ratio | 0.20 | 0.20 | | | 0.12 | 1.00 | 0.52 | 0.52 | | 0.69 | 0.69 | 0.69 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 244 | 336 | | | 166 | 1583 | 449 | 953 | | 570 | 1294 | 1100 |
| v/s Ratio Prot | 0.00 | 0.00 | | | | | | c0.27 | | 0.02 | c0.28 | |
| v/s Ratio Perm | 0.00 | | | | c0.04 | c0.06 | 0.01 | | | 0.08 | | 0.01 |
| v/c Ratio | 0.02 | 0.02 | | | 0.30 | 0.06 | 0.01 | 0.52 | | 0.14 | 0.41 | 0.01 |
| Uniform Delay, d1 | 18.5 | 18.5 | | | 23.3 | 0.0 | 6.8 | 9.2 | | 3.9 | 3.8 | 2.7 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.0 | 0.0 | | | 1.0 | 0.1 | 0.0 | 1.3 | | 0.1 | 0.6 | 0.0 |
| Delay (s) | 18.5 | 18.5 | | | 24.3 | 0.1 | 6.8 | 10.5 | | 4.0 | 4.3 | 2.7 |
| Level of Service | B | B | | | C | A | A | B | | A | A | A |
| Approach Delay (s) | | 18.5 | | | 8.7 | | | 10.4 | | | 4.3 | |
| Approach LOS | | B | | | A | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.45 | | |
| Actuated Cycle Length (s) | 57.7 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 64.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

Existing AM
7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 800 | 10 | 70 | 5 | 5 | 5 | 35 | 565 | 10 | 5 | 600 | 390 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1687 | 1583 | | 1750 | | 1770 | 1858 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.23 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (perm) | 1681 | 1687 | 1583 | | 1750 | | 433 | 1858 | | | 1855 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 800 | 10 | 70 | 5 | 5 | 5 | 35 | 565 | 10 | 5 | 600 | 390 |
| RTOR Reduction (vph) | 0 | 0 | 50 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 186 |
| Lane Group Flow (vph) | 400 | 410 | 20 | 0 | 10 | 0 | 35 | 575 | 0 | 0 | 605 | 204 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 9 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 9 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 31.6 | 31.6 | 31.6 | | 7.3 | | 68.1 | 68.1 | | | 59.9 | 59.9 |
| Effective Green, g (s) | 33.6 | 33.6 | 33.6 | | 9.3 | | 66.1 | 70.6 | | | 62.9 | 62.9 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | | 0.08 | | 0.55 | 0.59 | | | 0.52 | 0.52 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 470 | 472 | 443 | | 135 | | 307 | 1093 | | | 972 | 829 |
| v/s Ratio Prot | 0.24 | c0.24 | | | c0.01 | | 0.01 | c0.31 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.06 | | | | c0.33 | 0.13 |
| v/c Ratio | 0.85 | 0.87 | 0.04 | | 0.08 | | 0.11 | 0.53 | | | 0.62 | 0.25 |
| Uniform Delay, d1 | 40.8 | 41.1 | 31.5 | | 51.4 | | 15.7 | 14.7 | | | 20.2 | 15.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.09 | 0.00 |
| Incremental Delay, d2 | 13.8 | 15.5 | 0.0 | | 0.2 | | 0.2 | 0.3 | | | 1.0 | 0.1 |
| Delay (s) | 54.6 | 56.6 | 31.5 | | 51.5 | | 15.9 | 15.1 | | | 2.8 | 0.1 |
| Level of Service | D | E | C | | D | | B | B | | | A | A |
| Approach Delay (s) | | 53.7 | | | 51.5 | | | 15.1 | | | 1.7 | |
| Approach LOS | | D | | | D | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 23.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 71.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
 3: MD 108 & MD32 EB Ramps

Existing AM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|--------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 125 | 5 | 40 | 0 | 0 | 0 | 0 | 445 | 925 | 305 | 955 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.93 | | | | | | 0.95 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1608 | | | | | | 1676 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.10 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1608 | | | | | | 1676 | 1504 | 184 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 125 | 5 | 40 | 0 | 0 | 0 | 0 | 445 | 925 | 305 | 955 | 0 |
| RTOR Reduction (vph) | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 16 | 142 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 84 | 60 | 0 | 0 | 0 | 0 | 0 | 670 | 542 | 305 | 955 | 0 |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | |
| Actuated Green, G (s) | 7.3 | 7.3 | | | | | | 78.0 | 77.5 | 59.1 | 50.4 | |
| Effective Green, g (s) | 9.3 | 9.3 | | | | | | 77.5 | 81.0 | 61.1 | 53.4 | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.65 | 0.68 | 0.51 | 0.44 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 2.5 | 2.5 | | | | | | | | 2.5 | 5.0 | |
| Lane Grp Cap (vph) | 130 | 124 | | | | | | 1082 | 1015 | 367 | 1574 | |
| v/s Ratio Prot | | | | | | | | c0.40 | | c0.14 | 0.27 | |
| v/s Ratio Perm | c0.05 | 0.04 | | | | | | | c0.36 | c0.28 | | |
| v/c Ratio | 0.65 | 0.49 | | | | | | 0.62 | 0.53 | 0.83 | 0.61 | |
| Uniform Delay, d1 | 53.8 | 53.1 | | | | | | 12.5 | 9.9 | 33.0 | 25.3 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.62 | 1.12 | 2.00 | 0.64 | |
| Incremental Delay, d2 | 9.4 | 2.2 | | | | | | 0.7 | 0.4 | 13.4 | 1.6 | |
| Delay (s) | 63.1 | 55.2 | | | | | | 8.5 | 11.5 | 79.4 | 17.8 | |
| Level of Service | E | E | | | | | | A | B | E | B | |
| Approach Delay (s) | | 59.1 | | | 0.0 | | | 10.0 | | | 32.7 | |
| Approach LOS | | E | | | A | | | A | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 23.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 74.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

Existing AM
7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|------|------|------|-------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↖ | ↖ | ↖ | ↕ | | | ↕ | ↗ |
| Volume (vph) | 0 | 0 | 0 | 455 | 0 | 300 | 50 | 520 | 0 | 0 | 805 | 70 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Fr _t | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.99 | |
| Fl _t Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1681 | 1583 | 1770 | 3539 | | | 3497 | |
| Fl _t Permitted | | | | 0.95 | 0.95 | 1.00 | 0.26 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1681 | 1583 | 477 | 3539 | | | 3497 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 455 | 0 | 300 | 50 | 520 | 0 | 0 | 805 | 70 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 227 | 228 | 300 | 50 | 520 | 0 | 0 | 871 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 28.1 | 28.1 | 28.1 | 73.9 | 79.9 | | | 65.9 | |
| Effective Green, g (s) | | | | 31.1 | 31.1 | 31.1 | 79.9 | 82.9 | | | 68.9 | |
| Actuated g/C Ratio | | | | 0.26 | 0.26 | 0.26 | 0.67 | 0.69 | | | 0.57 | |
| Clearance Time (s) | | | | 6.0 | 6.0 | 6.0 | 6.0 | | | | 6.0 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 435 | 435 | 410 | 436 | 2444 | | | 2007 | |
| v/s Ratio Prot | | | | | | | 0.01 | c0.15 | | | c0.25 | |
| v/s Ratio Perm | | | | 0.14 | 0.14 | c0.19 | 0.07 | | | | | |
| v/c Ratio | | | | 0.52 | 0.52 | 0.73 | 0.11 | 0.21 | | | 0.43 | |
| Uniform Delay, d ₁ | | | | 38.1 | 38.1 | 40.6 | 13.6 | 6.7 | | | 14.5 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.21 | 1.14 | | | 0.63 | |
| Incremental Delay, d ₂ | | | | 1.1 | 1.1 | 6.6 | 0.1 | 0.0 | | | 0.7 | |
| Delay (s) | | | | 39.2 | 39.2 | 47.2 | 3.0 | 7.7 | | | 9.9 | |
| Level of Service | | | | D | D | D | A | A | | | A | |
| Approach Delay (s) | | 0.0 | | | 42.4 | | | 7.3 | | | 9.9 | |
| Approach LOS | | A | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 20.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.50 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 74.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

Existing AM
7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|------|-------|------|------|-------|------|------|-------|-------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 10 | 5 | 40 | 55 | 10 | 5 | 100 | 670 | 50 | 5 | 780 | 55 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Fr _t | | 1.00 | 0.85 | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Fl _t Protected | | 0.97 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1803 | 1583 | 1770 | 1770 | | 1770 | 3502 | | 1770 | 3504 | |
| Fl _t Permitted | | 0.84 | 1.00 | 0.75 | 1.00 | | 0.30 | 1.00 | | 0.38 | 1.00 | |
| Satd. Flow (perm) | | 1565 | 1583 | 1393 | 1770 | | 566 | 3502 | | 704 | 3504 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 10 | 5 | 40 | 55 | 10 | 5 | 100 | 670 | 50 | 5 | 780 | 55 |
| RTOR Reduction (vph) | 0 | 0 | 36 | 0 | 5 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 15 | 4 | 55 | 11 | 0 | 100 | 718 | 0 | 5 | 833 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 9.0 | 9.0 | 9.0 | 9.0 | | 99.5 | 93.9 | | 89.4 | 88.3 | |
| Effective Green, g (s) | | 12.0 | 12.0 | 12.0 | 12.0 | | 101.5 | 96.9 | | 93.4 | 91.3 | |
| Actuated g/C Ratio | | 0.10 | 0.10 | 0.10 | 0.10 | | 0.85 | 0.81 | | 0.78 | 0.76 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 156 | 158 | 139 | 177 | | 566 | 2827 | | 575 | 2665 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.01 | 0.21 | | 0.00 | c0.24 | |
| v/s Ratio Perm | | 0.01 | 0.00 | c0.04 | | | 0.14 | | | 0.01 | | |
| v/c Ratio | | 0.10 | 0.03 | 0.40 | 0.06 | | 0.18 | 0.25 | | 0.01 | 0.31 | |
| Uniform Delay, d ₁ | | 49.1 | 48.7 | 50.6 | 48.9 | | 1.9 | 2.8 | | 3.0 | 4.5 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.74 | 1.74 | | 0.92 | 1.12 | |
| Incremental Delay, d ₂ | | 0.3 | 0.1 | 1.9 | 0.1 | | 0.1 | 0.2 | | 0.0 | 0.3 | |
| Delay (s) | | 49.3 | 48.8 | 52.5 | 49.0 | | 3.5 | 5.1 | | 2.7 | 5.4 | |
| Level of Service | | D | D | D | D | | A | A | | A | A | |
| Approach Delay (s) | | 48.9 | | | 51.7 | | | 4.9 | | | 5.3 | |
| Approach LOS | | D | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 8.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.31 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 48.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

Existing AM
7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 5 | 5 | 5 | 140 | 10 | 300 | 5 | 510 | 165 | 240 | 695 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.95 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.96 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | 1681 | 1696 | 1583 | 1770 | 3409 | | 1770 | 3532 | |
| Flt Permitted | | 0.44 | | 0.75 | 0.74 | 1.00 | 0.38 | 1.00 | | 0.34 | 1.00 | |
| Satd. Flow (perm) | | 791 | | 1323 | 1315 | 1583 | 715 | 3409 | | 633 | 3532 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 5 | 140 | 10 | 300 | 5 | 510 | 165 | 240 | 695 | 10 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 264 | 0 | 17 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 10 | 0 | 73 | 77 | 37 | 5 | 658 | 0 | 240 | 705 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | 8 | 8 | 8 | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 4.0 | | 12.6 | 12.6 | 12.6 | 72.8 | 71.6 | | 86.4 | 80.7 | |
| Effective Green, g (s) | | 6.0 | | 14.6 | 14.6 | 14.6 | 76.8 | 74.6 | | 88.4 | 83.7 | |
| Actuated g/C Ratio | | 0.05 | | 0.12 | 0.12 | 0.12 | 0.64 | 0.62 | | 0.74 | 0.70 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 39 | | 160 | 159 | 192 | 485 | 2119 | | 582 | 2463 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.19 | | c0.04 | 0.20 | |
| v/s Ratio Perm | | c0.01 | | 0.06 | c0.06 | 0.02 | 0.01 | | | c0.26 | | |
| v/c Ratio | | 0.26 | | 0.46 | 0.48 | 0.19 | 0.01 | 0.31 | | 0.41 | 0.29 | |
| Uniform Delay, d1 | | 54.9 | | 49.0 | 49.2 | 47.4 | 7.8 | 10.6 | | 5.5 | 6.9 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.76 | 0.71 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.6 | | 2.1 | 2.3 | 0.5 | 0.0 | 0.4 | | 0.5 | 0.3 | |
| Delay (s) | | 58.5 | | 51.1 | 51.5 | 47.9 | 5.9 | 8.0 | | 6.0 | 7.2 | |
| Level of Service | | E | | D | D | D | A | A | | A | A | |
| Approach Delay (s) | | 58.5 | | | 49.0 | | | 7.9 | | | 6.9 | |
| Approach LOS | | E | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.42 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 54.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 7: MD 108 & Clarksville Square

Existing AM
 7/16/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 30 | 45 | 775 | 915 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 33 | 49 | 842 | 995 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage (veh) | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 609 | | |
| pX, platoon unblocked | 0.94 | | | | | |
| vC, conflicting volume | 1524 | 508 | 1016 | | | |
| vC1, stage 1 conf vol | 1005 | | | | | |
| vC2, stage 2 conf vol | 519 | | | | | |
| vCu, unblocked vol | 1435 | 508 | 1016 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 94 | 93 | | | |
| cM capacity (veh/h) | 284 | 510 | 678 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 5 | 33 | 49 | 421 | 421 | 663 | 353 |
| Volume Left | 5 | 0 | 49 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 33 | 0 | 0 | 0 | 0 | 22 |
| cSH | 284 | 510 | 678 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.02 | 0.06 | 0.07 | 0.25 | 0.25 | 0.39 | 0.21 |
| Queue Length 95th (ft) | 1 | 5 | 6 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 17.9 | 12.5 | 10.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | B | B | | | | |
| Approach Delay (s) | 13.3 | | 0.6 | | | 0.0 | |
| Approach LOS | B | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|----------------------|---|
| Average Delay | | 0.5 | |
| Intersection Capacity Utilization | 42.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

Existing AM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↖ | ↗ | | ↖ | ↗ | ↖ | ↑ | ↗ | ↖ | ↕ | ↗ |
| Volume (veh/h) | 10 | 5 | 30 | 10 | 5 | 75 | 30 | 690 | 30 | 35 | 895 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 14 | 7 | 41 | 14 | 7 | 103 | 41 | 945 | 41 | 48 | 1226 | 7 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | 1298 | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2459 | 2353 | 616 | 1781 | 2356 | 945 | 1233 | | | 945 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2459 | 2353 | 616 | 1781 | 2356 | 945 | 1233 | | | 945 | | |
| tC, single (s) | 7.6 | 6.6 | 7.0 | 7.6 | 6.6 | 7.0 | 4.2 | | | 4.2 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.1 | 3.4 | 3.6 | 4.1 | 3.4 | 2.3 | | | 2.3 | | |
| p0 queue free % | 0 | 76 | 90 | 58 | 76 | 60 | 92 | | | 93 | | |
| cM capacity (veh/h) | 6 | 29 | 424 | 33 | 29 | 255 | 539 | | | 697 | | |













| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|--------|------|-------|------|------|------|------|------|------|------|
| Volume Total | 21 | 41 | 21 | 103 | 41 | 945 | 41 | 48 | 817 | 416 |
| Volume Left | 14 | 0 | 14 | 0 | 41 | 0 | 0 | 48 | 0 | 0 |
| Volume Right | 0 | 41 | 0 | 103 | 0 | 0 | 41 | 0 | 0 | 7 |
| cSH | 9 | 424 | 31 | 255 | 539 | 1700 | 1700 | 697 | 1700 | 1700 |
| Volume to Capacity | 2.35 | 0.10 | 0.66 | 0.40 | 0.08 | 0.56 | 0.02 | 0.07 | 0.48 | 0.24 |
| Queue Length 95th (ft) | 90 | 8 | 55 | 46 | 6 | 0 | 0 | 6 | 0 | 0 |
| Control Delay (s) | 1450.3 | 14.4 | 242.8 | 28.3 | 12.2 | 0.0 | 0.0 | 10.5 | 0.0 | 0.0 |
| Lane LOS | F | B | F | D | B | | | B | | |
| Approach Delay (s) | 493.0 | | 64.0 | | 0.5 | | | 0.4 | | |
| Approach LOS | F | | F | | | | | | | |

Intersection Summary

| | |
|-----------------------------------|-------|
| Average Delay | 15.8 |
| Intersection Capacity Utilization | 54.3% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

HCM Signalized Intersection Capacity Analysis
9: MD 108 & Sheppard Lane

Existing AM
7/16/2014

| |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|
| Movement | NBL | NBT | SBT | SBR | SEL | SER |
| Lane Configurations |  |  |  |  |  |  |
| Volume (vph) | 150 | 630 | 710 | 30 | 40 | 270 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.5 | 5.5 | 5.5 | 5.5 | 4.5 | 4.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 1.00 | 0.85 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (prot) | 1703 | 1792 | 1792 | 1524 | 1703 | 1524 |
| Flt Permitted | 0.29 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 |
| Satd. Flow (perm) | 522 | 1792 | 1792 | 1524 | 1703 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 150 | 630 | 710 | 30 | 40 | 270 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 12 | 0 | 175 |
| Lane Group Flow (vph) | 150 | 630 | 710 | 18 | 40 | 95 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Perm | NA | NA | Perm | Prot | Perm |
| Protected Phases | | 2 | 6 | | 4 | |
| Permitted Phases | 2 | | | 6 | | 4 |
| Actuated Green, G (s) | 28.8 | 28.8 | 28.8 | 28.8 | 10.1 | 10.1 |
| Effective Green, g (s) | 28.8 | 28.8 | 28.8 | 28.8 | 10.1 | 10.1 |
| Actuated g/C Ratio | 0.59 | 0.59 | 0.59 | 0.59 | 0.21 | 0.21 |
| Clearance Time (s) | 5.5 | 5.5 | 5.5 | 5.5 | 4.5 | 4.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 307 | 1055 | 1055 | 897 | 351 | 314 |
| v/s Ratio Prot | | 0.35 | c0.40 | | 0.02 | |
| v/s Ratio Perm | 0.29 | | | 0.01 | | c0.06 |
| v/c Ratio | 0.49 | 0.60 | 0.67 | 0.02 | 0.11 | 0.30 |
| Uniform Delay, d1 | 5.8 | 6.4 | 6.8 | 4.2 | 15.8 | 16.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.2 | 0.9 | 1.7 | 0.0 | 0.1 | 0.5 |
| Delay (s) | 7.0 | 7.3 | 8.6 | 4.2 | 15.9 | 17.0 |
| Level of Service | A | A | A | A | B | B |
| Approach Delay (s) | | 7.2 | 8.4 | | 16.8 | |
| Approach LOS | | A | A | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 48.9 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 77.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

Existing AM
 7/16/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|------|------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 135 | 435 | 245 | 0 | 0 | 750 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 147 | 473 | 266 | 0 | 0 | 815 |
| RTOR Reduction (vph) | 0 | 366 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 147 | 107 | 266 | 0 | 0 | 815 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 14.3 | 14.3 | 37.9 | | | 37.9 |
| Effective Green, g (s) | 14.3 | 14.3 | 37.9 | | | 37.9 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.60 | | | 0.60 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 400 | 358 | 1117 | | | 1117 |
| v/s Ratio Prot | c0.08 | 0.07 | 0.14 | | | c0.44 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.37 | 0.30 | 0.24 | | | 0.73 |
| Uniform Delay, d1 | 20.6 | 20.3 | 5.9 | | | 9.0 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 0.8 | 0.6 | 0.2 | | | 3.0 |
| Delay (s) | 21.4 | 20.9 | 6.1 | | | 12.0 |
| Level of Service | C | C | A | | | B |
| Approach Delay (s) | 21.0 | | 6.1 | | | 12.0 |
| Approach LOS | C | | A | | | B |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 14.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 63.2 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 61.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

Existing AM
 7/16/2014
























| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕↔ | | ↗ | ↕ | ↗ |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 15 | 20 | 655 | 5 | 5 | 740 | 20 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 16 | 22 | 712 | 5 | 5 | 804 | 22 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1242 | 1587 | 815 | 1579 | 1595 | 359 | 826 | | | 717 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1242 | 1587 | 815 | 1579 | 1595 | 359 | 826 | | | 717 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 96 | 100 | 98 | 92 | 100 | 97 | 97 | | | 99 | | |
| cM capacity (veh/h) | 124 | 103 | 320 | 70 | 102 | 638 | 800 | | | 879 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 11 | 22 | 22 | 475 | 243 | 5 | 826 |
| Volume Left | 5 | 5 | 22 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 16 | 0 | 0 | 5 | 0 | 22 |
| cSH | 179 | 212 | 800 | 1700 | 1700 | 879 | 1700 |
| Volume to Capacity | 0.06 | 0.10 | 0.03 | 0.28 | 0.14 | 0.01 | 0.49 |
| Queue Length 95th (ft) | 5 | 8 | 2 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 26.4 | 23.9 | 9.6 | 0.0 | 0.0 | 9.1 | 0.0 |
| Lane LOS | D | C | A | | | A | |
| Approach Delay (s) | 26.4 | 23.9 | 0.3 | | | 0.1 | |
| Approach LOS | D | C | | | | | |

| Intersection Summary | |
|-----------------------------------|-------|
| Average Delay | 0.7 |
| Intersection Capacity Utilization | 50.2% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

Existing AM
 7/16/2014

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  |  |  |  |  |  |  |  |
| Volume (veh/h) | 5 | 0 | 5 | 35 | 5 | 20 | 5 | 655 | 15 | 20 | 725 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 38 | 5 | 22 | 5 | 712 | 16 | 22 | 788 | 5 |
| Pedestrians | | 1 | | | 1 | | | | | | | |
| Lane Width (ft) | | 12.0 | | | 12.0 | | | | | | | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | | | | | | | |
| Percent Blockage | | 0 | | | 0 | | | | | | | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1569 | 1556 | 789 | 1561 | 1562 | 713 | 794 | | | 713 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1569 | 1556 | 789 | 1561 | 1562 | 713 | 794 | | | 713 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 93 | 100 | 99 | 57 | 95 | 95 | 99 | | | 98 | | |
| cM capacity (veh/h) | 80 | 109 | 390 | 87 | 108 | 432 | 826 | | | 886 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 | | | | |
| Volume Total | 11 | 65 | 5 | 712 | 16 | 22 | 788 | 5 | | | | |
| Volume Left | 5 | 38 | 5 | 0 | 0 | 22 | 0 | 0 | | | | |
| Volume Right | 5 | 22 | 0 | 0 | 16 | 0 | 0 | 5 | | | | |
| cSH | 133 | 135 | 826 | 1700 | 1700 | 886 | 1700 | 1700 | | | | |
| Volume to Capacity | 0.08 | 0.48 | 0.01 | 0.42 | 0.01 | 0.02 | 0.46 | 0.00 | | | | |
| Queue Length 95th (ft) | 7 | 56 | 0 | 0 | 0 | 2 | 0 | 0 | | | | |
| Control Delay (s) | 34.5 | 56.4 | 9.4 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | | | | |
| Lane LOS | D | F | A | | | A | | | | | | |
| Approach Delay (s) | 34.5 | 56.4 | 0.1 | | | 0.2 | | | | | | |
| Approach LOS | D | F | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 2.6 | | | | | | | | | |
| Intersection Capacity Utilization | | | 51.1% | ICU Level of Service | | A | | | | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

Existing PM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 0 | 5 | 10 | 0 | 40 | 0 | 765 | 25 | 100 | 585 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.95 | 1.00 | | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | | | 1770 | 1583 | | 1854 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.75 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.21 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1406 | 1583 | | | 1863 | 1583 | | 1854 | | 397 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 0 | 5 | 10 | 0 | 40 | 0 | 765 | 25 | 100 | 585 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 |
| Lane Group Flow (vph) | 30 | 1 | 0 | 0 | 10 | 40 | 0 | 789 | 0 | 100 | 585 | 12 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.3 | 8.3 | | | 1.3 | 73.3 | | 44.7 | | 55.0 | 55.0 | 55.0 |
| Effective Green, g (s) | 10.3 | 10.3 | | | 3.3 | 73.3 | | 46.7 | | 57.0 | 57.0 | 57.0 |
| Actuated g/C Ratio | 0.14 | 0.14 | | | 0.05 | 1.00 | | 0.64 | | 0.78 | 0.78 | 0.78 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 222 | 222 | | | 83 | 1583 | | 1181 | | 445 | 1448 | 1230 |
| v/s Ratio Prot | c0.01 | 0.00 | | | | | | c0.43 | | 0.02 | c0.31 | |
| v/s Ratio Perm | 0.01 | | | | 0.01 | 0.03 | | | | 0.15 | | 0.01 |
| v/c Ratio | 0.14 | 0.00 | | | 0.12 | 0.03 | | 0.67 | | 0.22 | 0.40 | 0.01 |
| Uniform Delay, d1 | 27.6 | 27.1 | | | 33.6 | 0.0 | | 8.4 | | 5.4 | 2.6 | 1.8 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.3 | 0.0 | | | 0.7 | 0.0 | | 2.3 | | 0.3 | 0.5 | 0.0 |
| Delay (s) | 27.8 | 27.1 | | | 34.3 | 0.0 | | 10.7 | | 5.6 | 3.2 | 1.8 |
| Level of Service | C | C | | | C | A | | B | | A | A | A |
| Approach Delay (s) | | 27.7 | | | 6.9 | | | 10.7 | | | 3.5 | |
| Approach LOS | | C | | | A | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 73.3 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 65.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

Existing PM
7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 485 | 10 | 40 | 5 | 5 | 5 | 75 | 780 | 10 | 10 | 680 | 1025 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1689 | 1583 | | 1750 | | 1770 | 1859 | | | 1861 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.23 | 1.00 | | | 0.99 | 1.00 |
| Satd. Flow (perm) | 1681 | 1689 | 1583 | | 1750 | | 437 | 1859 | | | 1839 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 485 | 10 | 40 | 5 | 5 | 5 | 75 | 780 | 10 | 10 | 680 | 1025 |
| RTOR Reduction (vph) | 0 | 0 | 32 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 340 |
| Lane Group Flow (vph) | 242 | 253 | 8 | 0 | 10 | 0 | 75 | 790 | 0 | 0 | 690 | 685 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 27.5 | 27.5 | 27.5 | | 10.1 | | 96.4 | 96.4 | | | 88.4 | 88.4 |
| Effective Green, g (s) | 29.5 | 29.5 | 29.5 | | 12.1 | | 93.9 | 98.4 | | | 91.4 | 91.4 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.20 | | 0.08 | | 0.63 | 0.66 | | | 0.61 | 0.61 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.5 | 3.5 | 3.5 | | 3.0 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 330 | 332 | 311 | | 141 | | 353 | 1219 | | | 1120 | 964 |
| v/s Ratio Prot | 0.14 | c0.15 | | | c0.01 | | 0.01 | c0.42 | | | | |
| v/s Ratio Perm | | | 0.00 | | | | 0.12 | | | | 0.38 | c0.43 |
| v/c Ratio | 0.73 | 0.76 | 0.03 | | 0.07 | | 0.21 | 0.65 | | | 0.62 | 0.71 |
| Uniform Delay, d1 | 56.6 | 56.9 | 48.6 | | 63.8 | | 15.6 | 15.4 | | | 18.3 | 20.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.02 | 3.33 |
| Incremental Delay, d2 | 8.4 | 10.2 | 0.0 | | 0.2 | | 0.3 | 1.2 | | | 0.4 | 1.0 |
| Delay (s) | 65.0 | 67.1 | 48.7 | | 64.0 | | 15.9 | 16.6 | | | 0.7 | 68.2 |
| Level of Service | E | E | D | | E | | B | B | | | A | E |
| Approach Delay (s) | | 64.8 | | | 64.0 | | | 16.6 | | | 41.0 | |
| Approach LOS | | E | | | E | | | B | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 38.4 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 118.9% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
 3: MD 108 & MD32 EB Ramps

Existing PM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|--------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 115 | 5 | 40 | 0 | 0 | 0 | 0 | 710 | 560 | 280 | 1675 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.93 | | | | | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1603 | | | | | | 1770 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.20 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1603 | | | | | | 1770 | 1504 | 374 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 115 | 5 | 40 | 0 | 0 | 0 | 0 | 710 | 560 | 280 | 1675 | 0 |
| RTOR Reduction (vph) | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 140 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 79 | 58 | 0 | 0 | 0 | 0 | 0 | 710 | 420 | 280 | 1675 | 0 |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | |
| Actuated Green, G (s) | 10.1 | 10.1 | | | | | | 105.4 | 103.9 | 91.4 | 79.9 | |
| Effective Green, g (s) | 12.1 | 12.1 | | | | | | 104.9 | 108.4 | 93.4 | 82.9 | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.70 | 0.72 | 0.62 | 0.55 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | | | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | 135 | 129 | | | | | | 1237 | 1086 | 423 | 1955 | |
| v/s Ratio Prot | | | | | | | | c0.40 | | c0.09 | c0.47 | |
| v/s Ratio Perm | c0.05 | 0.04 | | | | | | | 0.28 | 0.32 | | |
| v/c Ratio | 0.59 | 0.45 | | | | | | 0.57 | 0.39 | 0.66 | 0.86 | |
| Uniform Delay, d1 | 66.5 | 65.8 | | | | | | 11.3 | 8.0 | 19.2 | 28.5 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.55 | 1.13 | 3.47 | 0.62 | |
| Incremental Delay, d2 | 6.3 | 2.5 | | | | | | 0.5 | 0.2 | 3.1 | 3.5 | |
| Delay (s) | 72.9 | 68.3 | | | | | | 6.7 | 9.2 | 69.9 | 21.1 | |
| Level of Service | E | E | | | | | | A | A | E | C | |
| Approach Delay (s) | | 70.5 | | | 0.0 | | | 7.8 | | | 28.1 | |
| Approach LOS | | E | | | A | | | A | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 22.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 79.2% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

Existing PM
7/16/2014

























| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|------|------|------|------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↗ | ↖ | ↖ | ↕ | | | ↕ | ↗ |
| Volume (vph) | 0 | 0 | 0 | 1000 | 10 | 390 | 45 | 780 | 0 | 0 | 955 | 125 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | 2.5 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Fr _t | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.98 | |
| Fl _t Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1687 | 1583 | 1770 | 3539 | | | 3478 | |
| Fl _t Permitted | | | | 0.95 | 0.95 | 1.00 | 0.15 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1687 | 1583 | 287 | 3539 | | | 3478 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 1000 | 10 | 390 | 45 | 780 | 0 | 0 | 955 | 125 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 500 | 510 | 390 | 45 | 780 | 0 | 0 | 1073 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 52.5 | 52.5 | 52.5 | 81.0 | 86.5 | | | 72.9 | |
| Effective Green, g (s) | | | | 55.5 | 55.5 | 55.5 | 87.0 | 89.5 | | | 75.9 | |
| Actuated g/C Ratio | | | | 0.37 | 0.37 | 0.37 | 0.58 | 0.60 | | | 0.51 | |
| Clearance Time (s) | | | | 5.5 | 5.5 | 5.5 | 5.5 | | | | 5.5 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 621 | 624 | 585 | 276 | 2111 | | | 1759 | |
| v/s Ratio Prot | | | | | | | 0.01 | c0.22 | | | c0.31 | |
| v/s Ratio Perm | | | | 0.30 | 0.30 | 0.25 | 0.08 | | | | | |
| v/c Ratio | | | | 0.81 | 0.82 | 0.67 | 0.16 | 0.37 | | | 0.61 | |
| Uniform Delay, d ₁ | | | | 42.4 | 42.7 | 39.5 | 32.9 | 15.7 | | | 26.5 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.74 | | | 0.84 | |
| Incremental Delay, d ₂ | | | | 7.5 | 8.2 | 2.9 | 0.2 | 0.1 | | | 1.5 | |
| Delay (s) | | | | 49.9 | 50.8 | 42.4 | 11.0 | 11.6 | | | 23.7 | |
| Level of Service | | | | D | D | D | B | B | | | C | |
| Approach Delay (s) | | 0.0 | | | 48.2 | | | 11.6 | | | 23.7 | |
| Approach LOS | | A | | | D | | | B | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|-----|
| HCM 2000 Control Delay | 31.0 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 7.5 |
| Intersection Capacity Utilization | 117.1% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

Existing PM
7/16/2014

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  |  |  |  | |  |  |  |  |  |  |
| Volume (vph) | 70 | 20 | 160 | 90 | 15 | 20 | 100 | 1000 | 70 | 10 | 830 | 50 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1793 | 1583 | 1770 | 1703 | | 1770 | 3504 | | 1770 | 3509 | |
| Flt Permitted | | 0.75 | 1.00 | 0.56 | 1.00 | | 0.29 | 1.00 | | 0.25 | 1.00 | |
| Satd. Flow (perm) | | 1400 | 1583 | 1048 | 1703 | | 534 | 3504 | | 465 | 3509 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 70 | 20 | 160 | 90 | 15 | 20 | 100 | 1000 | 70 | 10 | 830 | 50 |
| RTOR Reduction (vph) | 0 | 0 | 139 | 0 | 17 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 90 | 21 | 90 | 18 | 0 | 100 | 1068 | 0 | 10 | 878 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 16.8 | 16.8 | 16.8 | 16.8 | | 121.7 | 114.9 | | 112.4 | 110.1 | |
| Effective Green, g (s) | | 19.8 | 19.8 | 19.8 | 19.8 | | 123.7 | 117.9 | | 116.4 | 113.1 | |
| Actuated g/C Ratio | | 0.13 | 0.13 | 0.13 | 0.13 | | 0.82 | 0.79 | | 0.78 | 0.75 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 184 | 208 | 138 | 224 | | 515 | 2754 | | 398 | 2645 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.01 | c0.30 | | 0.00 | 0.25 | |
| v/s Ratio Perm | | 0.06 | 0.01 | c0.09 | | | 0.15 | | | 0.02 | | |
| v/c Ratio | | 0.49 | 0.10 | 0.65 | 0.08 | | 0.19 | 0.39 | | 0.03 | 0.33 | |
| Uniform Delay, d1 | | 60.4 | 57.3 | 61.8 | 57.1 | | 3.1 | 4.9 | | 4.0 | 6.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 0.84 | 0.92 | | 1.32 | 1.81 | |
| Incremental Delay, d2 | | 2.0 | 0.2 | 10.5 | 0.2 | | 0.2 | 0.4 | | 0.0 | 0.3 | |
| Delay (s) | | 62.4 | 57.5 | 72.4 | 57.3 | | 2.8 | 4.9 | | 5.3 | 11.3 | |
| Level of Service | | E | E | E | E | | A | A | | A | B | |
| Approach Delay (s) | | 59.3 | | | 68.1 | | | 4.8 | | | 11.2 | |
| Approach LOS | | E | | | E | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 16.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.42 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 55.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

Existing PM
7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 25 | 20 | 10 | 280 | 20 | 485 | 15 | 820 | 235 | 245 | 590 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.98 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1777 | | 1681 | 1695 | 1583 | 1770 | 3421 | | 1770 | 3522 | |
| Flt Permitted | | 0.18 | | 0.72 | 0.71 | 1.00 | 0.42 | 1.00 | | 0.16 | 1.00 | |
| Satd. Flow (perm) | | 327 | | 1276 | 1263 | 1583 | 784 | 3421 | | 303 | 3522 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 25 | 20 | 10 | 280 | 20 | 485 | 15 | 820 | 235 | 245 | 590 | 20 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 363 | 0 | 15 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 50 | 0 | 140 | 160 | 122 | 15 | 1040 | 0 | 245 | 609 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 16.5 | | 22.1 | 22.1 | 22.1 | 77.3 | 74.7 | | 94.4 | 87.3 | |
| Effective Green, g (s) | | 18.5 | | 24.1 | 24.1 | 24.1 | 81.3 | 77.7 | | 96.4 | 90.3 | |
| Actuated g/C Ratio | | 0.12 | | 0.16 | 0.16 | 0.16 | 0.54 | 0.52 | | 0.64 | 0.60 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 40 | | 205 | 202 | 254 | 455 | 1772 | | 362 | 2120 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.30 | | c0.08 | 0.17 | |
| v/s Ratio Perm | | c0.15 | | 0.11 | c0.13 | 0.08 | 0.02 | | | c0.36 | | |
| v/c Ratio | | 1.24 | | 0.68 | 0.79 | 0.48 | 0.03 | 0.59 | | 0.68 | 0.29 | |
| Uniform Delay, d1 | | 65.8 | | 59.3 | 60.5 | 57.3 | 15.9 | 25.0 | | 17.6 | 14.4 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.69 | 0.79 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 222.7 | | 9.0 | 18.8 | 1.4 | 0.0 | 1.4 | | 5.0 | 0.3 | |
| Delay (s) | | 288.4 | | 68.4 | 79.4 | 58.7 | 11.0 | 21.1 | | 22.6 | 14.7 | |
| Level of Service | | F | | E | E | E | B | C | | C | B | |
| Approach Delay (s) | | 288.4 | | | 64.6 | | | 20.9 | | | 17.0 | |
| Approach LOS | | F | | | E | | | C | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 37.4 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 76.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

Existing PM
7/16/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 45 | 100 | 105 | 1225 | 755 | 50 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 109 | 114 | 1332 | 821 | 54 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage veh | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 620 | | |
| pX, platoon unblocked | 0.81 | | | | | |
| vC, conflicting volume | 1742 | 438 | 875 | | | |
| vC1, stage 1 conf vol | 848 | | | | | |
| vC2, stage 2 conf vol | 894 | | | | | |
| vCu, unblocked vol | 1452 | 438 | 875 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 83 | 81 | 85 | | | |
| cM capacity (veh/h) | 293 | 567 | 767 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 49 | 109 | 114 | 666 | 666 | 547 | 328 |
| Volume Left | 49 | 0 | 114 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 109 | 0 | 0 | 0 | 0 | 54 |
| cSH | 293 | 567 | 767 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.17 | 0.19 | 0.15 | 0.39 | 0.39 | 0.32 | 0.19 |
| Queue Length 95th (ft) | 15 | 18 | 13 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 19.8 | 12.8 | 10.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | B | B | | | | |
| Approach Delay (s) | 15.0 | | 0.8 | | | 0.0 | |
| Approach LOS | B | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 1.4 | |
| Intersection Capacity Utilization | 43.9% | | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

HCM Unsignalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

Existing PM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↖ | ↗ | | ↖ | ↗ | ↖ | ↑ | ↗ | ↖ | ↖↗ | |
| Volume (veh/h) | 25 | 5 | 80 | 20 | 5 | 120 | 55 | 1110 | 65 | 85 | 660 | 40 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 34 | 7 | 110 | 27 | 7 | 164 | 75 | 1521 | 89 | 116 | 904 | 55 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | 1298 | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 3003 | 2836 | 479 | 2469 | 2863 | 1521 | 959 | | | 1521 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 3003 | 2836 | 479 | 2469 | 2863 | 1521 | 959 | | | 1521 | | |
| tC, single (s) | 7.6 | 6.6 | 7.0 | 7.6 | 6.6 | 7.0 | 4.2 | | | 4.2 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.1 | 3.4 | 3.6 | 4.1 | 3.4 | 2.3 | | | 2.3 | | |
| p0 queue free % | 0 | 34 | 79 | 0 | 31 | 0 | 89 | | | 72 | | |
| cM capacity (veh/h) | 0 | 10 | 522 | 4 | 10 | 103 | 689 | | | 416 | | |

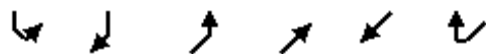
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|------|--------|-------|------|------|------|------|------|------|
| Volume Total | 41 | 110 | 34 | 164 | 75 | 1521 | 89 | 116 | 603 | 356 |
| Volume Left | 34 | 0 | 27 | 0 | 75 | 0 | 0 | 116 | 0 | 0 |
| Volume Right | 0 | 110 | 0 | 164 | 0 | 0 | 89 | 0 | 0 | 55 |
| cSH | 0 | 522 | 5 | 103 | 689 | 1700 | 1700 | 416 | 1700 | 1700 |
| Volume to Capacity | Err | 0.21 | 7.49 | 1.59 | 0.11 | 0.89 | 0.05 | 0.28 | 0.35 | 0.21 |
| Queue Length 95th (ft) | Err | 20 | Err | 313 | 9 | 0 | 0 | 28 | 0 | 0 |
| Control Delay (s) | Err | 13.7 | Err | 378.6 | 10.9 | 0.0 | 0.0 | 17.0 | 0.0 | 0.0 |
| Lane LOS | F | B | F | F | B | | | C | | |
| Approach Delay (s) | Err | | 2037.3 | | 0.5 | | | 1.8 | | |
| Approach LOS | F | | F | | | | | | | |

Intersection Summary

| | | | | | | | | | | |
|-----------------------------------|--|--|-------|--|----------------------|--|--|--|---|--|
| Average Delay | | | Err | | | | | | | |
| Intersection Capacity Utilization | | | 81.4% | | ICU Level of Service | | | | D | |
| Analysis Period (min) | | | 15 | | | | | | | |

HCM Signalized Intersection Capacity Analysis
9: MD 108 & Sheppard Lane

Existing PM
7/16/2014



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|-------|------|-------|------|------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 30 | 125 | 405 | 870 | 675 | 50 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| Lane Util. Factor | 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 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 1792 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.38 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 675 | 1792 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 125 | 405 | 870 | 675 | 50 |
| RTOR Reduction (vph) | 0 | 113 | 0 | 0 | 0 | 10 |
| Lane Group Flow (vph) | 30 | 12 | 405 | 870 | 675 | 40 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | Perm | NA | NA | Perm |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 8.5 | 8.5 | 72.4 | 72.4 | 72.4 | 72.4 |
| Effective Green, g (s) | 8.5 | 8.5 | 72.4 | 72.4 | 72.4 | 72.4 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.80 | 0.80 | 0.80 | 0.80 |
| Clearance Time (s) | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 159 | 142 | 537 | 1427 | 1427 | 1213 |
| v/s Ratio Prot | c0.02 | | | 0.49 | 0.38 | |
| v/s Ratio Perm | | 0.01 | c0.60 | | | 0.03 |
| v/c Ratio | 0.19 | 0.08 | 0.75 | 0.61 | 0.47 | 0.03 |
| Uniform Delay, d1 | 38.0 | 37.6 | 4.7 | 3.7 | 3.0 | 1.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.6 | 0.2 | 6.0 | 0.7 | 0.2 | 0.0 |
| Delay (s) | 38.6 | 37.9 | 10.7 | 4.4 | 3.3 | 1.9 |
| Level of Service | D | D | B | A | A | A |
| Approach Delay (s) | 38.0 | | | 6.4 | 3.2 | |
| Approach LOS | D | | | A | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 90.9 | Sum of lost time (s) | 10.0 |
| Intersection Capacity Utilization | 77.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

Existing PM
 7/16/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 10 | 25 | 845 | 0 | 0 | 725 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 27 | 918 | 0 | 0 | 788 |
| RTOR Reduction (vph) | 0 | 25 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 2 | 918 | 0 | 0 | 788 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 4.4 | 4.4 | 48.8 | | | 48.8 |
| Effective Green, g (s) | 4.4 | 4.4 | 48.8 | | | 48.8 |
| Actuated g/C Ratio | 0.07 | 0.07 | 0.76 | | | 0.76 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 121 | 108 | 1416 | | | 1416 |
| v/s Ratio Prot | c0.01 | 0.00 | c0.49 | | | 0.42 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.09 | 0.02 | 0.65 | | | 0.56 |
| Uniform Delay, d1 | 28.0 | 27.9 | 3.6 | | | 3.2 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 0.4 | 0.1 | 1.4 | | | 0.8 |
| Delay (s) | 28.5 | 28.0 | 5.1 | | | 4.0 |
| Level of Service | C | C | A | | | A |
| Approach Delay (s) | 28.1 | | 5.1 | | | 4.0 |
| Approach LOS | C | | A | | | A |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 5.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 64.2 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 60.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

Existing PM
 7/16/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕↔ | | ↗ | ↕ | ↘ |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 850 | 15 | 5 | 715 | 25 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 924 | 16 | 5 | 777 | 27 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1280 | 1753 | 791 | 1736 | 1758 | 470 | 804 | | | 940 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1280 | 1753 | 791 | 1736 | 1758 | 470 | 804 | | | 940 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 95 | 100 | 98 | 90 | 100 | 99 | 99 | | | 99 | | |
| cM capacity (veh/h) | 120 | 83 | 333 | 54 | 83 | 540 | 816 | | | 725 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 11 | 11 | 5 | 616 | 324 | 5 | 804 |
| Volume Left | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 5 | 0 | 0 | 16 | 0 | 27 |
| cSH | 177 | 99 | 816 | 1700 | 1700 | 725 | 1700 |
| Volume to Capacity | 0.06 | 0.11 | 0.01 | 0.36 | 0.19 | 0.01 | 0.47 |
| Queue Length 95th (ft) | 5 | 9 | 1 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 26.7 | 45.8 | 9.4 | 0.0 | 0.0 | 10.0 | 0.0 |
| Lane LOS | D | E | A | | | B | |
| Approach Delay (s) | 26.7 | 45.8 | 0.1 | | | 0.1 | |
| Approach LOS | D | E | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 0.5 | |
| Intersection Capacity Utilization | 49.1% | | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

Existing PM
 7/16/2014

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|-------|----------------------|------|------|------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 5 | 5 | 0 | 40 | 5 | 45 | 5 | 820 | 35 | 20 | 705 | 10 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 43 | 5 | 49 | 5 | 891 | 38 | 22 | 766 | 11 |
| Pedestrians | | | | | 1 | | | | | | 1 | |
| Lane Width (ft) | | | | | 12.0 | | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | | | | | | 4.0 | |
| Percent Blockage | | | | | 0 | | | | | | 0 | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1740 | 1713 | 766 | 1716 | 1724 | 893 | 777 | | | 892 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1740 | 1713 | 766 | 1716 | 1724 | 893 | 777 | | | 892 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 90 | 94 | 100 | 34 | 94 | 86 | 99 | | | 97 | | |
| cM capacity (veh/h) | 54 | 87 | 403 | 66 | 86 | 340 | 839 | | | 759 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 | | | | |
| Volume Total | 11 | 98 | 5 | 891 | 38 | 22 | 766 | 11 | | | | |
| Volume Left | 5 | 43 | 5 | 0 | 0 | 22 | 0 | 0 | | | | |
| Volume Right | 0 | 49 | 0 | 0 | 38 | 0 | 0 | 11 | | | | |
| cSH | 67 | 136 | 839 | 1700 | 1700 | 759 | 1700 | 1700 | | | | |
| Volume to Capacity | 0.16 | 0.72 | 0.01 | 0.52 | 0.02 | 0.03 | 0.45 | 0.01 | | | | |
| Queue Length 95th (ft) | 14 | 103 | 0 | 0 | 0 | 2 | 0 | 0 | | | | |
| Control Delay (s) | 69.3 | 79.0 | 9.3 | 0.0 | 0.0 | 9.9 | 0.0 | 0.0 | | | | |
| Lane LOS | F | F | A | | | A | | | | | | |
| Approach Delay (s) | 69.3 | 79.0 | 0.1 | | | 0.3 | | | | | | |
| Approach LOS | F | F | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 4.7 | | | | | | | | | |
| Intersection Capacity Utilization | | | 60.2% | ICU Level of Service | B | | | | | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

2016 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|-------|------|-------|------|-------|-------|------|
| Lane Configurations | ↖ | ↗ | | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↗ | ↖ |
| Volume (vph) | 5 | 5 | 10 | 40 | 10 | 90 | 5 | 578 | 30 | 80 | 643 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.90 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1676 | | | 1791 | 1583 | 1770 | 1849 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.56 | 1.00 | | | 0.76 | 1.00 | 0.42 | 1.00 | | 0.28 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1039 | 1676 | | | 1413 | 1583 | 784 | 1849 | | 515 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 10 | 40 | 10 | 90 | 5 | 578 | 30 | 80 | 643 | 20 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 |
| Lane Group Flow (vph) | 5 | 7 | 0 | 0 | 50 | 90 | 5 | 607 | 0 | 80 | 643 | 14 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 9.6 | 9.6 | | | 4.7 | 63.8 | 34.0 | 34.0 | | 44.2 | 44.2 | 44.2 |
| Effective Green, g (s) | 11.6 | 11.6 | | | 6.7 | 63.8 | 36.0 | 36.0 | | 46.2 | 46.2 | 46.2 |
| Actuated g/C Ratio | 0.18 | 0.18 | | | 0.11 | 1.00 | 0.56 | 0.56 | | 0.72 | 0.72 | 0.72 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 222 | 304 | | | 148 | 1583 | 442 | 1043 | | 514 | 1349 | 1146 |
| v/s Ratio Prot | 0.00 | 0.00 | | | | | | c0.33 | | 0.02 | c0.35 | |
| v/s Ratio Perm | 0.00 | | | | c0.04 | c0.06 | 0.01 | | | 0.10 | | 0.01 |
| v/c Ratio | 0.02 | 0.02 | | | 0.34 | 0.06 | 0.01 | 0.58 | | 0.16 | 0.48 | 0.01 |
| Uniform Delay, d1 | 21.4 | 21.4 | | | 26.5 | 0.0 | 6.1 | 9.0 | | 4.3 | 3.7 | 2.5 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.0 | 0.0 | | | 1.4 | 0.1 | 0.0 | 1.6 | | 0.1 | 0.8 | 0.0 |
| Delay (s) | 21.5 | 21.5 | | | 27.9 | 0.1 | 6.1 | 10.6 | | 4.4 | 4.5 | 2.5 |
| Level of Service | C | C | | | C | A | A | B | | A | A | A |
| Approach Delay (s) | | 21.5 | | | 10.0 | | | 10.6 | | | 4.4 | |
| Approach LOS | | C | | | A | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 63.8 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 69.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
 2: MD 108 & Ten Oaks. Rd./Gas Sta.

2016 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 829 | 10 | 70 | 5 | 5 | 5 | 35 | 678 | 10 | 5 | 713 | 417 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1687 | 1583 | | 1750 | | 1770 | 1859 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.13 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (perm) | 1681 | 1687 | 1583 | | 1750 | | 242 | 1859 | | | 1855 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 829 | 10 | 70 | 5 | 5 | 5 | 35 | 678 | 10 | 5 | 713 | 417 |
| RTOR Reduction (vph) | 0 | 0 | 50 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 172 |
| Lane Group Flow (vph) | 414 | 425 | 20 | 0 | 10 | 0 | 35 | 688 | 0 | 0 | 718 | 245 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 32.0 | 32.0 | 32.0 | | 7.5 | | 64.5 | 64.5 | | | 59.3 | 59.3 |
| Effective Green, g (s) | 34.0 | 34.0 | 34.0 | | 9.5 | | 62.0 | 66.5 | | | 62.3 | 62.3 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | | 0.08 | | 0.52 | 0.55 | | | 0.52 | 0.52 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 476 | 477 | 448 | | 138 | | 203 | 1030 | | | 963 | 821 |
| v/s Ratio Prot | 0.25 | c0.25 | | | c0.01 | | 0.01 | c0.37 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.08 | | | | c0.39 | 0.15 |
| v/c Ratio | 0.87 | 0.89 | 0.04 | | 0.08 | | 0.17 | 0.67 | | | 0.75 | 0.30 |
| Uniform Delay, d1 | 40.9 | 41.2 | 31.2 | | 51.2 | | 20.4 | 18.9 | | | 22.6 | 16.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.14 | 0.00 |
| Incremental Delay, d2 | 15.5 | 18.5 | 0.0 | | 0.2 | | 0.4 | 1.5 | | | 2.3 | 0.1 |
| Delay (s) | 56.4 | 59.7 | 31.2 | | 51.4 | | 20.8 | 20.4 | | | 5.6 | 0.1 |
| Level of Service | E | E | C | | D | | C | C | | | A | A |
| Approach Delay (s) | | 56.0 | | | 51.4 | | | 20.4 | | | 3.6 | |
| Approach LOS | | E | | | D | | | C | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 25.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 78.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

3: MD 108 & MD32 EB Ramps

2016 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|--------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 170 | 5 | 40 | 0 | 0 | 0 | 0 | 565 | 947 | 405 | 1095 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.94 | | | | | | 0.95 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1620 | | | | | | 1689 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.11 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1620 | | | | | | 1689 | 1504 | 207 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 170 | 5 | 40 | 0 | 0 | 0 | 0 | 565 | 947 | 405 | 1095 | 0 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 14 | 135 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 114 | 82 | 0 | 0 | 0 | 0 | 0 | 797 | 566 | 405 | 1095 | 0 |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | |
| Actuated Green, G (s) | 7.5 | 7.5 | | | | | | 74.0 | 73.5 | 58.5 | 49.8 | |
| Effective Green, g (s) | 9.5 | 9.5 | | | | | | 73.5 | 77.0 | 60.5 | 52.8 | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.61 | 0.64 | 0.50 | 0.44 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 2.5 | 2.5 | | | | | | | | 2.5 | 5.0 | |
| Lane Grp Cap (vph) | 133 | 128 | | | | | | 1034 | 965 | 423 | 1557 | |
| v/s Ratio Prot | | | | | | | | c0.47 | | c0.20 | 0.31 | |
| v/s Ratio Perm | c0.07 | 0.05 | | | | | | | 0.38 | c0.29 | | |
| v/c Ratio | 0.86 | 0.64 | | | | | | 0.77 | 0.59 | 0.96 | 0.70 | |
| Uniform Delay, d1 | 54.6 | 53.6 | | | | | | 17.1 | 12.3 | 35.9 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.71 | 0.74 | 1.86 | 0.87 | |
| Incremental Delay, d2 | 38.2 | 8.8 | | | | | | 2.2 | 0.6 | 28.3 | 2.3 | |
| Delay (s) | 92.8 | 62.4 | | | | | | 14.2 | 9.7 | 95.1 | 26.0 | |
| Level of Service | F | E | | | | | | B | A | F | C | |
| Approach Delay (s) | | 78.5 | | | 0.0 | | | 12.2 | | | 44.6 | |
| Approach LOS | | E | | | A | | | B | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 31.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.91 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 87.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

2016 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|-------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↖ | ↖ | ↖ | ↑↑ | | | ↑↑ | |
| Volume (vph) | 0 | 0 | 0 | 462 | 0 | 354 | 51 | 684 | 0 | 0 | 1038 | 115 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Frt | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.99 | |
| Flt Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1681 | 1583 | 1770 | 3539 | | | 3486 | |
| Flt Permitted | | | | 0.95 | 0.95 | 1.00 | 0.15 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1681 | 1583 | 281 | 3539 | | | 3486 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 462 | 0 | 354 | 51 | 684 | 0 | 0 | 1038 | 115 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 231 | 231 | 354 | 51 | 684 | 0 | 0 | 1147 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 32.2 | 32.2 | 32.2 | 69.8 | 75.8 | | | 61.8 | |
| Effective Green, g (s) | | | | 35.2 | 35.2 | 35.2 | 75.8 | 78.8 | | | 64.8 | |
| Actuated g/C Ratio | | | | 0.29 | 0.29 | 0.29 | 0.63 | 0.66 | | | 0.54 | |
| Clearance Time (s) | | | | 6.0 | 6.0 | 6.0 | 6.0 | | | | 6.0 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 493 | 493 | 464 | 313 | 2323 | | | 1882 | |
| v/s Ratio Prot | | | | | | | 0.01 | c0.19 | | | c0.33 | |
| v/s Ratio Perm | | | | 0.14 | 0.14 | c0.22 | 0.09 | | | | | |
| v/c Ratio | | | | 0.47 | 0.47 | 0.76 | 0.16 | 0.29 | | | 0.61 | |
| Uniform Delay, d1 | | | | 34.7 | 34.7 | 38.6 | 22.5 | 8.8 | | | 18.9 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.18 | 1.08 | | | 0.64 | |
| Incremental Delay, d2 | | | | 0.7 | 0.7 | 7.3 | 0.2 | 0.0 | | | 1.4 | |
| Delay (s) | | | | 35.4 | 35.4 | 45.9 | 4.3 | 9.5 | | | 13.5 | |
| Level of Service | | | | D | D | D | A | A | | | B | |
| Approach Delay (s) | | 0.0 | | | 40.0 | | | 9.2 | | | 13.5 | |
| Approach LOS | | A | | | D | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 20.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 87.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2016 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|------|------|-------|-------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 14 | 5 | 44 | 55 | 10 | 5 | 113 | 875 | 50 | 5 | 1054 | 70 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1797 | 1583 | 1770 | 1770 | | 1770 | 3511 | | 1770 | 3506 | |
| Flt Permitted | | 0.82 | 1.00 | 0.75 | 1.00 | | 0.21 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | | 1521 | 1583 | 1388 | 1770 | | 400 | 3511 | | 573 | 3506 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 14 | 5 | 44 | 55 | 10 | 5 | 113 | 875 | 50 | 5 | 1054 | 70 |
| RTOR Reduction (vph) | 0 | 0 | 40 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 19 | 4 | 55 | 11 | 0 | 113 | 924 | 0 | 5 | 1122 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 9.0 | 9.0 | 9.0 | 9.0 | | 99.5 | 93.9 | | 89.3 | 88.2 | |
| Effective Green, g (s) | | 12.0 | 12.0 | 12.0 | 12.0 | | 101.5 | 96.9 | | 93.3 | 91.2 | |
| Actuated g/C Ratio | | 0.10 | 0.10 | 0.10 | 0.10 | | 0.85 | 0.81 | | 0.78 | 0.76 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 152 | 158 | 138 | 177 | | 438 | 2835 | | 476 | 2664 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.02 | 0.26 | | 0.00 | c0.32 | |
| v/s Ratio Perm | | 0.01 | 0.00 | c0.04 | | | 0.20 | | | 0.01 | | |
| v/c Ratio | | 0.12 | 0.03 | 0.40 | 0.06 | | 0.26 | 0.33 | | 0.01 | 0.42 | |
| Uniform Delay, d1 | | 49.2 | 48.7 | 50.6 | 48.9 | | 2.6 | 3.0 | | 3.0 | 5.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.48 | 1.36 | | 0.74 | 1.02 | |
| Incremental Delay, d2 | | 0.4 | 0.1 | 1.9 | 0.1 | | 0.3 | 0.3 | | 0.0 | 0.5 | |
| Delay (s) | | 49.6 | 48.8 | 52.5 | 49.0 | | 4.2 | 4.4 | | 2.2 | 5.6 | |
| Level of Service | | D | D | D | D | | A | A | | A | A | |
| Approach Delay (s) | | 49.0 | | | 51.8 | | | 4.4 | | | 5.6 | |
| Approach LOS | | D | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 7.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.41 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 57.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2016 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 5 | 5 | 5 | 153 | 10 | 360 | 5 | 716 | 173 | 297 | 970 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.95 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | 1681 | 1695 | 1583 | 1770 | 3436 | | 1770 | 3534 | |
| Flt Permitted | | 0.44 | | 0.75 | 0.74 | 1.00 | 0.29 | 1.00 | | 0.25 | 1.00 | |
| Satd. Flow (perm) | | 791 | | 1323 | 1311 | 1583 | 537 | 3436 | | 465 | 3534 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 5 | 153 | 10 | 360 | 5 | 716 | 173 | 297 | 970 | 10 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 315 | 0 | 12 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 10 | 0 | 80 | 83 | 45 | 5 | 877 | 0 | 297 | 980 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | 8 | 8 | 8 | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 4.0 | | 13.1 | 13.1 | 13.1 | 70.6 | 69.4 | | 85.9 | 80.2 | |
| Effective Green, g (s) | | 6.0 | | 15.1 | 15.1 | 15.1 | 74.6 | 72.4 | | 87.9 | 83.2 | |
| Actuated g/C Ratio | | 0.05 | | 0.13 | 0.13 | 0.13 | 0.62 | 0.60 | | 0.73 | 0.69 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 39 | | 166 | 164 | 199 | 366 | 2073 | | 492 | 2450 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.26 | | c0.07 | 0.28 | |
| v/s Ratio Perm | | c0.01 | | 0.06 | c0.06 | 0.03 | 0.01 | | | c0.37 | | |
| v/c Ratio | | 0.26 | | 0.48 | 0.51 | 0.23 | 0.01 | 0.42 | | 0.60 | 0.40 | |
| Uniform Delay, d1 | | 54.9 | | 48.8 | 49.0 | 47.2 | 8.6 | 12.7 | | 7.3 | 7.8 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.65 | 0.68 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.6 | | 2.2 | 2.4 | 0.6 | 0.0 | 0.6 | | 2.1 | 0.5 | |
| Delay (s) | | 58.5 | | 51.0 | 51.4 | 47.8 | 5.7 | 9.2 | | 9.4 | 8.3 | |
| Level of Service | | E | | D | D | D | A | A | | A | A | |
| Approach Delay (s) | | 58.5 | | | 48.9 | | | 9.2 | | | 8.6 | |
| Approach LOS | | E | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 64.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2016 AM
8/4/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 30 | 45 | 984 | 1190 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 33 | 49 | 1070 | 1293 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage (veh) | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 609 | | |
| pX, platoon unblocked | 0.90 | | | | | |
| vC, conflicting volume | 1937 | 658 | 1315 | | | |
| vC1, stage 1 conf vol | 1304 | | | | | |
| vC2, stage 2 conf vol | 633 | | | | | |
| vCu, unblocked vol | 1817 | 658 | 1315 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 92 | 91 | | | |
| cM capacity (veh/h) | 201 | 407 | 522 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 5 | 33 | 49 | 535 | 535 | 862 | 453 |
| Volume Left | 5 | 0 | 49 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 33 | 0 | 0 | 0 | 0 | 22 |
| cSH | 201 | 407 | 522 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.03 | 0.08 | 0.09 | 0.31 | 0.31 | 0.51 | 0.27 |
| Queue Length 95th (ft) | 2 | 6 | 8 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 23.4 | 14.6 | 12.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | B | B | | | | |
| Approach Delay (s) | 15.9 | | 0.6 | | | 0.0 | |
| Approach LOS | C | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 0.5 | |
| Intersection Capacity Utilization | 47.4% | | ICU Level of Service A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2016 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↖ | ↗ | | ↖ | ↗ | ↖ | ↑ | ↗ | ↖ | ↕ | ↗ |
| Volume (veh/h) | 10 | 5 | 30 | 19 | 5 | 80 | 30 | 891 | 38 | 39 | 1161 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 14 | 7 | 41 | 26 | 7 | 110 | 41 | 1221 | 52 | 53 | 1590 | 7 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | 1298 | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 3116 | 3003 | 799 | 2249 | 3007 | 1221 | 1597 | | | 1221 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 3116 | 3003 | 799 | 2249 | 3007 | 1221 | 1597 | | | 1221 | | |
| tC, single (s) | 7.6 | 6.6 | 7.0 | 7.6 | 6.6 | 7.0 | 4.2 | | | 4.2 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.1 | 3.4 | 3.6 | 4.1 | 3.4 | 2.3 | | | 2.3 | | |
| p0 queue free % | 0 | 32 | 87 | 0 | 31 | 34 | 89 | | | 90 | | |
| cM capacity (veh/h) | 1 | 10 | 320 | 7 | 10 | 166 | 388 | | | 545 | | |

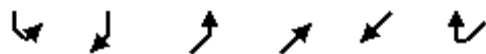
| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|--------|------|--------|------|------|------|------|------|------|------|
| Volume Total | 21 | 41 | 33 | 110 | 41 | 1221 | 52 | 53 | 1060 | 537 |
| Volume Left | 14 | 0 | 26 | 0 | 41 | 0 | 0 | 53 | 0 | 0 |
| Volume Right | 0 | 41 | 0 | 110 | 0 | 0 | 52 | 0 | 0 | 7 |
| cSH | 1 | 320 | 8 | 166 | 388 | 1700 | 1700 | 545 | 1700 | 1700 |
| Volume to Capacity | 23.99 | 0.13 | 4.23 | 0.66 | 0.11 | 0.72 | 0.03 | 0.10 | 0.62 | 0.32 |
| Queue Length 95th (ft) | Err | 11 | Err | 95 | 9 | 0 | 0 | 8 | 0 | 0 |
| Control Delay (s) | Err | 17.9 | Err | 61.0 | 15.4 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 |
| Lane LOS | F | C | F | F | C | | | B | | |
| Approach Delay (s) | 3344.9 | | 2354.4 | | 0.5 | | | 0.4 | | |
| Approach LOS | F | | F | | | | | | | |

Intersection Summary

| | | | | | | | | | | |
|-----------------------------------|--|-------|--|----------------------|--|--|--|---|--|--|
| Average Delay | | 171.3 | | | | | | | | |
| Intersection Capacity Utilization | | 65.2% | | ICU Level of Service | | | | C | | |
| Analysis Period (min) | | 15 | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2016 AM
 5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|------|-------|-------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 54 | 366 | 194 | 713 | 813 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Lane Util. Factor | 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 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 1792 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.15 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 277 | 1792 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 54 | 366 | 194 | 713 | 813 | 35 |
| RTOR Reduction (vph) | 0 | 215 | 0 | 0 | 0 | 12 |
| Lane Group Flow (vph) | 54 | 151 | 194 | 713 | 813 | 23 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 14.1 | 14.1 | 62.9 | 62.9 | 48.7 | 48.7 |
| Effective Green, g (s) | 14.1 | 14.1 | 62.9 | 62.9 | 48.7 | 48.7 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.72 | 0.72 | 0.56 | 0.56 |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 276 | 246 | 367 | 1295 | 1003 | 853 |
| v/s Ratio Prot | 0.03 | | 0.06 | c0.40 | c0.45 | |
| v/s Ratio Perm | | c0.10 | 0.32 | | | 0.01 |
| v/c Ratio | 0.20 | 0.62 | 0.53 | 0.55 | 0.81 | 0.03 |
| Uniform Delay, d1 | 31.5 | 33.9 | 11.2 | 5.5 | 15.4 | 8.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.3 | 4.5 | 1.4 | 0.5 | 5.0 | 0.0 |
| Delay (s) | 31.9 | 38.5 | 12.6 | 6.1 | 20.5 | 8.6 |
| Level of Service | C | D | B | A | C | A |
| Approach Delay (s) | 37.6 | | | 7.4 | 20.0 | |
| Approach LOS | D | | | A | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 18.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 87.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 73.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2016 AM
 8/4/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|------|-------|------|------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 135 | 435 | 360 | 0 | 0 | 878 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 147 | 473 | 391 | 0 | 0 | 954 |
| RTOR Reduction (vph) | 0 | 339 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 147 | 134 | 391 | 0 | 0 | 954 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 15.5 | 15.5 | 51.2 | | | 51.2 |
| Effective Green, g (s) | 15.5 | 15.5 | 51.2 | | | 51.2 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.66 | | | 0.66 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 353 | 315 | 1227 | | | 1227 |
| v/s Ratio Prot | 0.08 | c0.08 | 0.21 | | | c0.51 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.42 | 0.43 | 0.32 | | | 0.78 |
| Uniform Delay, d1 | 27.2 | 27.2 | 5.7 | | | 9.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.1 | 1.3 | 0.3 | | | 3.7 |
| Delay (s) | 28.2 | 28.5 | 6.0 | | | 13.0 |
| Level of Service | C | C | A | | | B |
| Approach Delay (s) | 28.4 | | 6.0 | | | 13.0 |
| Approach LOS | C | | A | | | B |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 77.7 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 62.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2016 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕↔ | | ↗ | ↕ | ↘ |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 15 | 20 | 770 | 5 | 5 | 868 | 20 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 16 | 22 | 837 | 5 | 5 | 943 | 22 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1443 | 1851 | 954 | 1843 | 1859 | 421 | 965 | | | 842 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1443 | 1851 | 954 | 1843 | 1859 | 421 | 965 | | | 842 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 94 | 100 | 98 | 88 | 100 | 97 | 97 | | | 99 | | |
| cM capacity (veh/h) | 88 | 71 | 259 | 44 | 70 | 581 | 709 | | | 789 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 11 | 22 | 22 | 558 | 284 | 5 | 965 |
| Volume Left | 5 | 5 | 22 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 16 | 0 | 0 | 5 | 0 | 22 |
| cSH | 131 | 144 | 709 | 1700 | 1700 | 789 | 1700 |
| Volume to Capacity | 0.08 | 0.15 | 0.03 | 0.33 | 0.17 | 0.01 | 0.57 |
| Queue Length 95th (ft) | 7 | 13 | 2 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 35.0 | 34.4 | 10.2 | 0.0 | 0.0 | 9.6 | 0.0 |
| Lane LOS | D | D | B | | | A | |
| Approach Delay (s) | 35.0 | 34.4 | 0.3 | | | 0.1 | |
| Approach LOS | D | D | | | | | |

| Intersection Summary | |
|-----------------------------------|-------|
| Average Delay | 0.8 |
| Intersection Capacity Utilization | 56.9% |
| ICU Level of Service | B |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2016 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↔ | ↔ | ↑ | ↔ | ↔ | ↑ | ↔ |
| Volume (veh/h) | 5 | 0 | 5 | 52 | 5 | 23 | 5 | 764 | 21 | 21 | 836 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 57 | 5 | 25 | 5 | 830 | 23 | 23 | 909 | 5 |
| Pedestrians | | 1 | | | 1 | | | | | | | |
| Lane Width (ft) | | 12.0 | | | 12.0 | | | | | | | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | | | | | | | |
| Percent Blockage | | 0 | | | 0 | | | | | | | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1812 | 1798 | 910 | 1802 | 1803 | 831 | 915 | | | 831 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1812 | 1798 | 910 | 1802 | 1803 | 831 | 915 | | | 831 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 90 | 100 | 98 | 4 | 93 | 93 | 99 | | | 97 | | |
| cM capacity (veh/h) | 52 | 77 | 333 | 59 | 76 | 369 | 744 | | | 800 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|-------|------|------|------|------|------|------|
| Volume Total | 11 | 87 | 5 | 830 | 23 | 23 | 909 | 5 |
| Volume Left | 5 | 57 | 5 | 0 | 0 | 23 | 0 | 0 |
| Volume Right | 5 | 25 | 0 | 0 | 23 | 0 | 0 | 5 |
| cSH | 90 | 83 | 744 | 1700 | 1700 | 800 | 1700 | 1700 |
| Volume to Capacity | 0.12 | 1.05 | 0.01 | 0.49 | 0.01 | 0.03 | 0.53 | 0.00 |
| Queue Length 95th (ft) | 10 | 150 | 1 | 0 | 0 | 2 | 0 | 0 |
| Control Delay (s) | 50.5 | 205.1 | 9.9 | 0.0 | 0.0 | 9.6 | 0.0 | 0.0 |
| Lane LOS | F | F | A | | | A | | |
| Approach Delay (s) | 50.5 | 205.1 | 0.1 | | | 0.2 | | |
| Approach LOS | F | F | | | | | | |

| Intersection Summary | | |
|-----------------------------------|-------|----------------------|
| Average Delay | | 9.9 |
| Intersection Capacity Utilization | 56.9% | ICU Level of Service |
| Analysis Period (min) | | 15 |
| | | B |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

2016 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 0 | 5 | 10 | 0 | 40 | 0 | 898 | 25 | 100 | 692 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.95 | 1.00 | | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | | | 1770 | 1583 | | 1855 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.77 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.14 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1433 | 1583 | | | 1863 | 1583 | | 1855 | | 269 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 0 | 5 | 10 | 0 | 40 | 0 | 898 | 25 | 100 | 692 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Lane Group Flow (vph) | 30 | 1 | 0 | 0 | 10 | 40 | 0 | 923 | 0 | 100 | 692 | 12 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 7.9 | 7.9 | | | 1.2 | 72.9 | | 44.7 | | 55.0 | 55.0 | 55.0 |
| Effective Green, g (s) | 9.9 | 9.9 | | | 3.2 | 72.9 | | 46.7 | | 57.0 | 57.0 | 57.0 |
| Actuated g/C Ratio | 0.14 | 0.14 | | | 0.04 | 1.00 | | 0.64 | | 0.78 | 0.78 | 0.78 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 216 | 214 | | | 81 | 1583 | | 1188 | | 360 | 1456 | 1237 |
| v/s Ratio Prot | c0.01 | 0.00 | | | | | | c0.50 | | 0.03 | c0.37 | |
| v/s Ratio Perm | 0.01 | | | | 0.01 | 0.03 | | | | 0.19 | | 0.01 |
| v/c Ratio | 0.14 | 0.00 | | | 0.12 | 0.03 | | 0.78 | | 0.28 | 0.48 | 0.01 |
| Uniform Delay, d1 | 27.7 | 27.2 | | | 33.5 | 0.0 | | 9.4 | | 8.1 | 2.8 | 1.7 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.3 | 0.0 | | | 0.7 | 0.0 | | 4.1 | | 0.4 | 0.7 | 0.0 |
| Delay (s) | 28.0 | 27.2 | | | 34.2 | 0.0 | | 13.5 | | 8.5 | 3.5 | 1.8 |
| Level of Service | C | C | | | C | A | | B | | A | A | A |
| Approach Delay (s) | | 27.9 | | | 6.9 | | | 13.5 | | | 4.0 | |
| Approach LOS | | C | | | A | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 72.9 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 72.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

2016 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 502 | 10 | 40 | 5 | 5 | 5 | 75 | 913 | 10 | 10 | 787 | 1042 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1688 | 1583 | | 1750 | | 1770 | 1860 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.15 | 1.00 | | | 0.99 | 1.00 |
| Satd. Flow (perm) | 1681 | 1688 | 1583 | | 1750 | | 283 | 1860 | | | 1838 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 502 | 10 | 40 | 5 | 5 | 5 | 75 | 913 | 10 | 10 | 787 | 1042 |
| RTOR Reduction (vph) | 0 | 0 | 31 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 314 |
| Lane Group Flow (vph) | 251 | 261 | 9 | 0 | 10 | 0 | 75 | 923 | 0 | 0 | 797 | 728 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 30.4 | 30.4 | 30.4 | | 10.0 | | 93.6 | 93.6 | | | 85.5 | 85.5 |
| Effective Green, g (s) | 32.4 | 32.4 | 32.4 | | 12.0 | | 91.1 | 95.6 | | | 88.5 | 88.5 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | | 0.08 | | 0.61 | 0.64 | | | 0.59 | 0.59 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 363 | 364 | 341 | | 140 | | 262 | 1185 | | | 1084 | 933 |
| v/s Ratio Prot | 0.15 | c0.15 | | | c0.01 | | 0.02 | c0.50 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.16 | | | | 0.43 | c0.46 |
| v/c Ratio | 0.69 | 0.72 | 0.03 | | 0.07 | | 0.29 | 0.78 | | | 0.74 | 0.78 |
| Uniform Delay, d1 | 54.2 | 54.5 | 46.4 | | 63.9 | | 20.7 | 19.6 | | | 22.3 | 23.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.02 | 2.00 |
| Incremental Delay, d2 | 5.6 | 6.6 | 0.0 | | 0.2 | | 0.6 | 3.2 | | | 0.9 | 1.4 |
| Delay (s) | 59.8 | 61.1 | 46.4 | | 64.0 | | 21.3 | 22.7 | | | 1.3 | 48.1 |
| Level of Service | E | E | D | | E | | C | C | | | A | D |
| Approach Delay (s) | | 59.5 | | | 64.0 | | | 22.6 | | | 27.8 | |
| Approach LOS | | E | | | E | | | C | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 31.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 126.9% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

3: MD 108 & MD32 EB Ramps

2016 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|--------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 145 | 5 | 41 | 0 | 0 | 0 | 0 | 846 | 574 | 343 | 1798 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frbp, ped/bikes | 1.00 | 1.00 | | | | | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 0.98 | 0.99 | | | | | | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.93 | | | | | | 0.98 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1650 | 1597 | | | | | | 1730 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.06 | 1.00 | |
| Satd. Flow (perm) | 1650 | 1597 | | | | | | 1730 | 1504 | 118 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 145 | 5 | 41 | 0 | 0 | 0 | 0 | 846 | 574 | 343 | 1798 | 0 |
| RTOR Reduction (vph) | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 4 | 128 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 97 | 76 | 0 | 0 | 0 | 0 | 0 | 991 | 297 | 343 | 1798 | 0 |
| Confl. Peds. (#/hr) | 5 | | | | | | | | | | | |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | |
| Actuated Green, G (s) | 10.0 | 10.0 | | | | | | 98.6 | 97.1 | 88.6 | 77.0 | |
| Effective Green, g (s) | 12.0 | 12.0 | | | | | | 98.1 | 101.6 | 90.6 | 80.0 | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.65 | 0.68 | 0.60 | 0.53 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 2.5 | 2.5 | | | | | | | | 2.5 | 5.0 | |
| Lane Grp Cap (vph) | 132 | 127 | | | | | | 1131 | 1018 | 373 | 1887 | |
| v/s Ratio Prot | | | | | | | | c0.57 | | c0.17 | c0.51 | |
| v/s Ratio Perm | c0.06 | 0.05 | | | | | | | 0.20 | 0.39 | | |
| v/c Ratio | 0.73 | 0.60 | | | | | | 0.88 | 0.29 | 0.92 | 0.95 | |
| Uniform Delay, d1 | 67.4 | 66.7 | | | | | | 21.0 | 9.7 | 49.4 | 33.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.72 | 0.99 | 1.46 | 0.75 | |
| Incremental Delay, d2 | 18.0 | 6.1 | | | | | | 5.4 | 0.1 | 20.3 | 8.1 | |
| Delay (s) | 85.4 | 72.8 | | | | | | 20.6 | 9.8 | 92.4 | 33.1 | |
| Level of Service | F | E | | | | | | C | A | F | C | |
| Approach Delay (s) | | 79.2 | | | 0.0 | | | 17.3 | | | 42.6 | |
| Approach LOS | | E | | | A | | | B | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 34.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.93 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 91.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

2016 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|------|------|------|------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↖ | ↖ | ↖ | ↕ | | | ↕ | ↖ |
| Volume (vph) | 0 | 0 | 0 | 1023 | 10 | 487 | 46 | 945 | 0 | 0 | 1118 | 154 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Fr _t | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.98 | |
| Fl _t Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1687 | 1583 | 1770 | 3539 | | | 3475 | |
| Fl _t Permitted | | | | 0.95 | 0.95 | 1.00 | 0.10 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1687 | 1583 | 182 | 3539 | | | 3475 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 1023 | 10 | 487 | 46 | 945 | 0 | 0 | 1118 | 154 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 511 | 522 | 487 | 46 | 945 | 0 | 0 | 1265 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 51.4 | 51.4 | 51.4 | 80.6 | 86.6 | | | 72.0 | |
| Effective Green, g (s) | | | | 54.4 | 54.4 | 54.4 | 86.6 | 89.6 | | | 75.0 | |
| Actuated g/C Ratio | | | | 0.36 | 0.36 | 0.36 | 0.58 | 0.60 | | | 0.50 | |
| Clearance Time (s) | | | | 6.0 | 6.0 | 6.0 | 6.0 | | | | 6.0 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 609 | 611 | 574 | 227 | 2113 | | | 1737 | |
| v/s Ratio Prot | | | | | | | 0.02 | c0.27 | | | c0.36 | |
| v/s Ratio Perm | | | | 0.30 | 0.31 | 0.31 | 0.10 | | | | | |
| v/c Ratio | | | | 0.84 | 0.85 | 0.85 | 0.20 | 0.45 | | | 0.73 | |
| Uniform Delay, d ₁ | | | | 43.8 | 44.1 | 44.0 | 41.3 | 16.6 | | | 29.5 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.15 | 0.61 | | | 0.75 | |
| Incremental Delay, d ₂ | | | | 9.9 | 11.2 | 11.2 | 0.2 | 0.1 | | | 2.5 | |
| Delay (s) | | | | 53.7 | 55.4 | 55.2 | 6.3 | 10.2 | | | 24.6 | |
| Level of Service | | | | D | E | E | A | B | | | C | |
| Approach Delay (s) | | 0.0 | | | 54.7 | | | 10.0 | | | 24.6 | |
| Approach LOS | | A | | | D | | | B | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|-----|
| HCM 2000 Control Delay | 32.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 132.1% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2016 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|-------|------|-------|-------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 91 | 20 | 178 | 90 | 15 | 20 | 113 | 1249 | 70 | 10 | 1004 | 64 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1789 | 1583 | 1770 | 1703 | | 1770 | 3511 | | 1770 | 3507 | |
| Flt Permitted | | 0.74 | 1.00 | 0.50 | 1.00 | | 0.23 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | | 1379 | 1583 | 940 | 1703 | | 423 | 3511 | | 341 | 3507 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 91 | 20 | 178 | 90 | 15 | 20 | 113 | 1249 | 70 | 10 | 1004 | 64 |
| RTOR Reduction (vph) | 0 | 0 | 153 | 0 | 17 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 111 | 25 | 90 | 18 | 0 | 113 | 1318 | 0 | 10 | 1066 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 17.8 | 17.8 | 17.8 | 17.8 | | 120.7 | 113.8 | | 111.2 | 108.8 | |
| Effective Green, g (s) | | 20.8 | 20.8 | 20.8 | 20.8 | | 122.7 | 116.8 | | 115.2 | 111.8 | |
| Actuated g/C Ratio | | 0.14 | 0.14 | 0.14 | 0.14 | | 0.82 | 0.78 | | 0.77 | 0.75 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 191 | 219 | 130 | 236 | | 430 | 2733 | | 303 | 2613 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.02 | c0.38 | | 0.00 | 0.30 | |
| v/s Ratio Perm | | 0.08 | 0.02 | c0.10 | | | 0.20 | | | 0.02 | | |
| v/c Ratio | | 0.58 | 0.11 | 0.69 | 0.08 | | 0.26 | 0.48 | | 0.03 | 0.41 | |
| Uniform Delay, d1 | | 60.5 | 56.5 | 61.6 | 56.2 | | 4.0 | 5.9 | | 4.7 | 7.0 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 0.74 | 0.79 | | 1.13 | 1.62 | |
| Incremental Delay, d2 | | 4.4 | 0.2 | 14.8 | 0.1 | | 0.3 | 0.5 | | 0.0 | 0.4 | |
| Delay (s) | | 65.0 | 56.8 | 76.3 | 56.4 | | 3.2 | 5.1 | | 5.3 | 11.7 | |
| Level of Service | | E | E | E | E | | A | A | | A | B | |
| Approach Delay (s) | | 59.9 | | | 70.7 | | | 5.0 | | | 11.7 | |
| Approach LOS | | E | | | E | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 15.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 63.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2016 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 25 | 20 | 10 | 288 | 20 | 518 | 15 | 1081 | 247 | 277 | 769 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.98 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1777 | | 1681 | 1696 | 1583 | 1770 | 3440 | | 1770 | 3526 | |
| Flt Permitted | | 0.18 | | 0.72 | 0.71 | 1.00 | 0.35 | 1.00 | | 0.07 | 1.00 | |
| Satd. Flow (perm) | | 327 | | 1276 | 1264 | 1583 | 658 | 3440 | | 131 | 3526 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 25 | 20 | 10 | 288 | 20 | 518 | 15 | 1081 | 247 | 277 | 769 | 20 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 333 | 0 | 12 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 50 | 0 | 150 | 158 | 185 | 15 | 1316 | 0 | 277 | 788 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 16.5 | | 22.0 | 22.0 | 22.0 | 72.0 | 69.4 | | 94.5 | 87.4 | |
| Effective Green, g (s) | | 18.5 | | 24.0 | 24.0 | 24.0 | 76.0 | 72.4 | | 96.5 | 90.4 | |
| Actuated g/C Ratio | | 0.12 | | 0.16 | 0.16 | 0.16 | 0.51 | 0.48 | | 0.64 | 0.60 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 40 | | 204 | 202 | 253 | 367 | 1660 | | 331 | 2125 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.38 | | c0.13 | 0.22 | |
| v/s Ratio Perm | | c0.15 | | 0.12 | c0.13 | 0.12 | 0.02 | | | c0.41 | | |
| v/c Ratio | | 1.24 | | 0.74 | 0.78 | 0.73 | 0.04 | 0.79 | | 0.84 | 0.37 | |
| Uniform Delay, d1 | | 65.8 | | 60.0 | 60.5 | 59.9 | 18.4 | 32.5 | | 44.0 | 15.2 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.69 | 0.74 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 222.7 | | 12.9 | 17.7 | 10.1 | 0.0 | 3.7 | | 16.6 | 0.5 | |
| Delay (s) | | 288.4 | | 72.8 | 78.2 | 70.0 | 12.7 | 27.8 | | 60.6 | 15.7 | |
| Level of Service | | F | | E | E | E | B | C | | E | B | |
| Approach Delay (s) | | 288.4 | | | 72.1 | | | 27.6 | | | 27.4 | |
| Approach LOS | | F | | | E | | | C | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 43.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 86.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2016 PM
8/4/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 45 | 100 | 105 | 1495 | 941 | 50 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 109 | 114 | 1625 | 1023 | 54 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage (veh) | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 609 | | |
| pX, platoon unblocked | 0.70 | | | | | |
| vC, conflicting volume | 2091 | 539 | 1077 | | | |
| vC1, stage 1 conf vol | 1050 | | | | | |
| vC2, stage 2 conf vol | 1041 | | | | | |
| vCu, unblocked vol | 1696 | 539 | 1077 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 80 | 78 | 82 | | | |
| cM capacity (veh/h) | 247 | 487 | 643 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 49 | 109 | 114 | 812 | 812 | 682 | 395 |
| Volume Left | 49 | 0 | 114 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 109 | 0 | 0 | 0 | 0 | 54 |
| cSH | 247 | 487 | 643 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.20 | 0.22 | 0.18 | 0.48 | 0.48 | 0.40 | 0.23 |
| Queue Length 95th (ft) | 18 | 21 | 16 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 23.1 | 14.5 | 11.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | B | B | | | | |
| Approach Delay (s) | 17.2 | | 0.8 | | | 0.0 | |
| Approach LOS | C | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|--|-------|------------------------|
| Average Delay | | 1.4 | |
| Intersection Capacity Utilization | | 51.3% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

HCM Unsignalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2016 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↖ | ↗ | | ↖ | ↗ | ↖ | ↑ | ↗ | ↖ | ↕ | ↗ |
| Volume (veh/h) | 25 | 5 | 80 | 24 | 5 | 124 | 55 | 1374 | 71 | 88 | 842 | 40 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 34 | 7 | 110 | 33 | 7 | 170 | 75 | 1882 | 97 | 121 | 1153 | 55 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | 1298 | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 3628 | 3455 | 604 | 2964 | 3482 | 1882 | 1208 | | | 1882 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 3628 | 3455 | 604 | 2964 | 3482 | 1882 | 1208 | | | 1882 | | |
| tC, single (s) | 7.6 | 6.6 | 7.0 | 7.6 | 6.6 | 7.0 | 4.2 | | | 4.2 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.1 | 3.4 | 3.6 | 4.1 | 3.4 | 2.3 | | | 2.3 | | |
| p0 queue free % | 0 | 0 | 75 | 0 | 0 | 0 | 86 | | | 60 | | |
| cM capacity (veh/h) | 0 | 3 | 432 | 0 | 3 | 58 | 551 | | | 299 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|------|------|--------|------|------|------|------|------|------|
| Volume Total | 41 | 110 | 40 | 170 | 75 | 1882 | 97 | 121 | 769 | 439 |
| Volume Left | 34 | 0 | 33 | 0 | 75 | 0 | 0 | 121 | 0 | 0 |
| Volume Right | 0 | 110 | 0 | 170 | 0 | 0 | 97 | 0 | 0 | 55 |
| cSH | 0 | 432 | 0 | 58 | 551 | 1700 | 1700 | 299 | 1700 | 1700 |
| Volume to Capacity | Err | 0.25 | Err | 2.93 | 0.14 | 1.11 | 0.06 | 0.40 | 0.45 | 0.26 |
| Queue Length 95th (ft) | Err | 25 | Err | 440 | 12 | 0 | 0 | 47 | 0 | 0 |
| Control Delay (s) | Err | 16.2 | Err | 1022.2 | 12.6 | 0.0 | 0.0 | 24.9 | 0.0 | 0.0 |
| Lane LOS | F | C | F | F | B | | | C | | |
| Approach Delay (s) | Err | | Err | | 0.5 | | | 2.3 | | |
| Approach LOS | F | | F | | | | | | | |

Intersection Summary

| | | | | | | | | | | |
|-----------------------------------|--|--|-------|--|----------------------|--|--|--|---|--|
| Average Delay | | | Err | | | | | | | |
| Intersection Capacity Utilization | | | 93.3% | | ICU Level of Service | | | | F | |
| Analysis Period (min) | | | 15 | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2016 PM
 5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|-------|------|-------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 39 | 185 | 502 | 972 | 748 | 65 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Lane Util. Factor | 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 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 1792 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.10 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 184 | 1792 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 39 | 185 | 502 | 972 | 748 | 65 |
| RTOR Reduction (vph) | 0 | 167 | 0 | 0 | 0 | 32 |
| Lane Group Flow (vph) | 39 | 18 | 502 | 972 | 748 | 33 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 9.4 | 9.4 | 78.7 | 78.7 | 45.3 | 45.3 |
| Effective Green, g (s) | 9.4 | 9.4 | 78.7 | 78.7 | 45.3 | 45.3 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.80 | 0.80 | 0.46 | 0.46 |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 163 | 146 | 602 | 1437 | 827 | 703 |
| v/s Ratio Prot | c0.02 | | c0.25 | 0.54 | c0.42 | |
| v/s Ratio Perm | | 0.01 | 0.42 | | | 0.02 |
| v/c Ratio | 0.24 | 0.12 | 0.83 | 0.68 | 0.90 | 0.05 |
| Uniform Delay, d1 | 41.0 | 40.6 | 24.7 | 4.2 | 24.4 | 14.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | 0.4 | 9.7 | 1.3 | 13.2 | 0.0 |
| Delay (s) | 41.8 | 40.9 | 34.4 | 5.5 | 37.6 | 14.5 |
| Level of Service | D | D | C | A | D | B |
| Approach Delay (s) | 41.1 | | | 15.3 | 35.8 | |
| Approach LOS | D | | | B | D | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 24.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 98.1 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 85.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2016 PM
 8/4/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 10 | 25 | 981 | 0 | 0 | 829 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 27 | 1066 | 0 | 0 | 901 |
| RTOR Reduction (vph) | 0 | 26 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 1 | 1066 | 0 | 0 | 901 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 4.7 | 4.7 | 72.8 | | | 72.8 |
| Effective Green, g (s) | 4.7 | 4.7 | 72.8 | | | 72.8 |
| Actuated g/C Ratio | 0.05 | 0.05 | 0.82 | | | 0.82 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 94 | 84 | 1532 | | | 1532 |
| v/s Ratio Prot | c0.01 | 0.00 | c0.57 | | | 0.48 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.12 | 0.02 | 0.70 | | | 0.59 |
| Uniform Delay, d1 | 39.9 | 39.7 | 3.3 | | | 2.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 0.8 | 0.1 | 1.8 | | | 0.9 |
| Delay (s) | 40.7 | 39.8 | 5.0 | | | 3.6 |
| Level of Service | D | D | A | | | A |
| Approach Delay (s) | 40.1 | | 5.0 | | | 3.6 |
| Approach LOS | D | | A | | | A |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 5.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 88.5 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 67.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2016 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕↔ | | ↗ | ↔ | |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 986 | 15 | 5 | 819 | 25 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 1072 | 16 | 5 | 890 | 27 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1467 | 2014 | 904 | 1997 | 2019 | 544 | 917 | | | 1088 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1467 | 2014 | 904 | 1997 | 2019 | 544 | 917 | | | 1088 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 94 | 100 | 98 | 84 | 100 | 99 | 99 | | | 99 | | |
| cM capacity (veh/h) | 87 | 57 | 280 | 34 | 57 | 483 | 739 | | | 637 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 11 | 11 | 5 | 714 | 374 | 5 | 917 |
| Volume Left | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 5 | 0 | 0 | 16 | 0 | 27 |
| cSH | 133 | 64 | 739 | 1700 | 1700 | 637 | 1700 |
| Volume to Capacity | 0.08 | 0.17 | 0.01 | 0.42 | 0.22 | 0.01 | 0.54 |
| Queue Length 95th (ft) | 7 | 14 | 1 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 34.5 | 72.2 | 9.9 | 0.0 | 0.0 | 10.7 | 0.0 |
| Lane LOS | D | F | A | | | B | |
| Approach Delay (s) | 34.5 | 72.2 | 0.0 | | | 0.1 | |
| Approach LOS | D | F | | | | | |

| Intersection Summary | |
|-----------------------------------|------------------------------|
| Average Delay | 0.6 |
| Intersection Capacity Utilization | 54.6% ICU Level of Service A |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2016 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↔ | ↔ | ↑ | ↔ | ↔ | ↑ | ↔ |
| Volume (veh/h) | 5 | 5 | 0 | 49 | 5 | 47 | 5 | 939 | 52 | 23 | 800 | 10 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 53 | 5 | 51 | 5 | 1021 | 57 | 25 | 870 | 11 |
| Pedestrians | | 1 | | | 1 | | | | | | | |
| Lane Width (ft) | | 12.0 | | | 12.0 | | | | | | | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | | | | | | | |
| Percent Blockage | | 0 | | | 0 | | | | | | | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1980 | 1953 | 871 | 1955 | 1964 | 1022 | 881 | | | 1022 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1980 | 1953 | 871 | 1955 | 1964 | 1022 | 881 | | | 1022 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 84 | 91 | 100 | 0 | 91 | 82 | 99 | | | 96 | | |
| cM capacity (veh/h) | 34 | 61 | 350 | 43 | 60 | 286 | 766 | | | 679 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|-------|-------|------|------|------|------|------|------|
| Volume Total | 11 | 110 | 5 | 1021 | 57 | 25 | 870 | 11 |
| Volume Left | 5 | 53 | 5 | 0 | 0 | 25 | 0 | 0 |
| Volume Right | 0 | 51 | 0 | 0 | 57 | 0 | 0 | 11 |
| cSH | 44 | 78 | 766 | 1700 | 1700 | 679 | 1700 | 1700 |
| Volume to Capacity | 0.25 | 1.41 | 0.01 | 0.60 | 0.03 | 0.04 | 0.51 | 0.01 |
| Queue Length 95th (ft) | 21 | 218 | 1 | 0 | 0 | 3 | 0 | 0 |
| Control Delay (s) | 112.7 | 339.4 | 9.7 | 0.0 | 0.0 | 10.5 | 0.0 | 0.0 |
| Lane LOS | F | F | A | | | B | | |
| Approach Delay (s) | 112.7 | 339.4 | 0.0 | | | 0.3 | | |
| Approach LOS | F | F | | | | | | |

| Intersection Summary | | |
|-----------------------------------|-------|------------------------|
| Average Delay | | 18.4 |
| Intersection Capacity Utilization | 66.1% | ICU Level of Service C |
| Analysis Period (min) | | 15 |

HCM Signalized Intersection Capacity Analysis
1: MD 108 & Church Ent./Guildford Rd.

2016 AM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|-------|------|-------|------|-------|-------|------|
| Lane Configurations | ↖ | ↗ | | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↗ | ↖ |
| Volume (vph) | 5 | 5 | 10 | 40 | 10 | 90 | 5 | 578 | 30 | 80 | 643 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.90 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1676 | | | 1791 | 1583 | 1770 | 1849 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.56 | 1.00 | | | 0.76 | 1.00 | 0.42 | 1.00 | | 0.28 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1039 | 1676 | | | 1413 | 1583 | 784 | 1849 | | 515 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 10 | 40 | 10 | 90 | 5 | 578 | 30 | 80 | 643 | 20 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 |
| Lane Group Flow (vph) | 5 | 7 | 0 | 0 | 50 | 90 | 5 | 607 | 0 | 80 | 643 | 14 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 9.6 | 9.6 | | | 4.7 | 63.8 | 34.0 | 34.0 | | 44.2 | 44.2 | 44.2 |
| Effective Green, g (s) | 11.6 | 11.6 | | | 6.7 | 63.8 | 36.0 | 36.0 | | 46.2 | 46.2 | 46.2 |
| Actuated g/C Ratio | 0.18 | 0.18 | | | 0.11 | 1.00 | 0.56 | 0.56 | | 0.72 | 0.72 | 0.72 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 222 | 304 | | | 148 | 1583 | 442 | 1043 | | 514 | 1349 | 1146 |
| v/s Ratio Prot | 0.00 | 0.00 | | | | | | c0.33 | | 0.02 | c0.35 | |
| v/s Ratio Perm | 0.00 | | | | c0.04 | c0.06 | 0.01 | | | 0.10 | | 0.01 |
| v/c Ratio | 0.02 | 0.02 | | | 0.34 | 0.06 | 0.01 | 0.58 | | 0.16 | 0.48 | 0.01 |
| Uniform Delay, d1 | 21.4 | 21.4 | | | 26.5 | 0.0 | 6.1 | 9.0 | | 4.3 | 3.7 | 2.5 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.0 | 0.0 | | | 1.4 | 0.1 | 0.0 | 1.6 | | 0.1 | 0.8 | 0.0 |
| Delay (s) | 21.5 | 21.5 | | | 27.9 | 0.1 | 6.1 | 10.6 | | 4.4 | 4.5 | 2.5 |
| Level of Service | C | C | | | C | A | A | B | | A | A | A |
| Approach Delay (s) | | 21.5 | | | 10.0 | | | 10.6 | | | 4.4 | |
| Approach LOS | | C | | | A | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 7.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 63.8 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 69.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

2016 AM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 829 | 10 | 70 | 5 | 5 | 5 | 35 | 678 | 10 | 5 | 713 | 417 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1687 | 1583 | | 1750 | | 1770 | 1859 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.13 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (perm) | 1681 | 1687 | 1583 | | 1750 | | 242 | 1859 | | | 1855 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 829 | 10 | 70 | 5 | 5 | 5 | 35 | 678 | 10 | 5 | 713 | 417 |
| RTOR Reduction (vph) | 0 | 0 | 50 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 172 |
| Lane Group Flow (vph) | 414 | 425 | 20 | 0 | 10 | 0 | 35 | 688 | 0 | 0 | 718 | 245 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 32.0 | 32.0 | 32.0 | | 7.5 | | 64.5 | 64.5 | | | 59.3 | 59.3 |
| Effective Green, g (s) | 34.0 | 34.0 | 34.0 | | 9.5 | | 62.0 | 66.5 | | | 62.3 | 62.3 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | | 0.08 | | 0.52 | 0.55 | | | 0.52 | 0.52 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 476 | 477 | 448 | | 138 | | 203 | 1030 | | | 963 | 821 |
| v/s Ratio Prot | 0.25 | c0.25 | | | c0.01 | | 0.01 | c0.37 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.08 | | | | c0.39 | 0.15 |
| v/c Ratio | 0.87 | 0.89 | 0.04 | | 0.08 | | 0.17 | 0.67 | | | 0.75 | 0.30 |
| Uniform Delay, d1 | 40.9 | 41.2 | 31.2 | | 51.2 | | 20.4 | 18.9 | | | 22.6 | 16.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.14 | 0.00 |
| Incremental Delay, d2 | 15.5 | 18.5 | 0.0 | | 0.2 | | 0.4 | 1.5 | | | 2.3 | 0.1 |
| Delay (s) | 56.4 | 59.7 | 31.2 | | 51.4 | | 20.8 | 20.4 | | | 5.6 | 0.1 |
| Level of Service | E | E | C | | D | | C | C | | | A | A |
| Approach Delay (s) | | 56.0 | | | 51.4 | | | 20.4 | | | 3.6 | |
| Approach LOS | | E | | | D | | | C | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 25.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 78.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
3: MD 108 & MD32 EB Ramps

2016 AM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|--------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 170 | 5 | 40 | 0 | 0 | 0 | 0 | 565 | 947 | 405 | 1095 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.94 | | | | | | 0.95 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1620 | | | | | | 1689 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.11 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1620 | | | | | | 1689 | 1504 | 207 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 170 | 5 | 40 | 0 | 0 | 0 | 0 | 565 | 947 | 405 | 1095 | 0 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 14 | 135 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 114 | 82 | 0 | 0 | 0 | 0 | 0 | 797 | 566 | 405 | 1095 | 0 |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | |
| Actuated Green, G (s) | 7.5 | 7.5 | | | | | | 74.0 | 73.5 | 58.5 | 49.8 | |
| Effective Green, g (s) | 9.5 | 9.5 | | | | | | 73.5 | 77.0 | 60.5 | 52.8 | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.61 | 0.64 | 0.50 | 0.44 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 2.5 | 2.5 | | | | | | | | 2.5 | 5.0 | |
| Lane Grp Cap (vph) | 133 | 128 | | | | | | 1034 | 965 | 423 | 1557 | |
| v/s Ratio Prot | | | | | | | | c0.47 | | c0.20 | 0.31 | |
| v/s Ratio Perm | c0.07 | 0.05 | | | | | | | 0.38 | c0.29 | | |
| v/c Ratio | 0.86 | 0.64 | | | | | | 0.77 | 0.59 | 0.96 | 0.70 | |
| Uniform Delay, d1 | 54.6 | 53.6 | | | | | | 17.1 | 12.3 | 35.9 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.71 | 0.74 | 1.86 | 0.87 | |
| Incremental Delay, d2 | 38.2 | 8.8 | | | | | | 2.2 | 0.6 | 28.3 | 2.3 | |
| Delay (s) | 92.8 | 62.4 | | | | | | 14.2 | 9.7 | 95.1 | 26.0 | |
| Level of Service | F | E | | | | | | B | A | F | C | |
| Approach Delay (s) | | 78.5 | | | 0.0 | | | 12.2 | | | 44.6 | |
| Approach LOS | | E | | | A | | | B | | | D | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 31.7 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.91 | C |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) |
| Intersection Capacity Utilization | 87.9% | 15.5 |
| Analysis Period (min) | 15 | ICU Level of Service |
| c Critical Lane Group | | E |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

2016 AM Alternative 2

8/4/2014

























| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|-------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↖ | ↖ | ↖ | ↑↑ | | | ↑↑ | |
| Volume (vph) | 0 | 0 | 0 | 462 | 0 | 354 | 51 | 684 | 0 | 0 | 1038 | 115 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Frt | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.99 | |
| Flt Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1681 | 1583 | 1770 | 3539 | | | 3486 | |
| Flt Permitted | | | | 0.95 | 0.95 | 1.00 | 0.15 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1681 | 1583 | 281 | 3539 | | | 3486 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 462 | 0 | 354 | 51 | 684 | 0 | 0 | 1038 | 115 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 231 | 231 | 354 | 51 | 684 | 0 | 0 | 1147 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 32.2 | 32.2 | 32.2 | 69.8 | 75.8 | | | 61.8 | |
| Effective Green, g (s) | | | | 35.2 | 35.2 | 35.2 | 75.8 | 78.8 | | | 64.8 | |
| Actuated g/C Ratio | | | | 0.29 | 0.29 | 0.29 | 0.63 | 0.66 | | | 0.54 | |
| Clearance Time (s) | | | | 6.0 | 6.0 | 6.0 | 6.0 | | | | 6.0 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 493 | 493 | 464 | 313 | 2323 | | | 1882 | |
| v/s Ratio Prot | | | | | | | 0.01 | c0.19 | | | c0.33 | |
| v/s Ratio Perm | | | | 0.14 | 0.14 | c0.22 | 0.09 | | | | | |
| v/c Ratio | | | | 0.47 | 0.47 | 0.76 | 0.16 | 0.29 | | | 0.61 | |
| Uniform Delay, d1 | | | | 34.7 | 34.7 | 38.6 | 22.5 | 8.8 | | | 18.9 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.18 | 1.08 | | | 0.64 | |
| Incremental Delay, d2 | | | | 0.7 | 0.7 | 7.3 | 0.2 | 0.0 | | | 1.4 | |
| Delay (s) | | | | 35.4 | 35.4 | 45.9 | 4.3 | 9.5 | | | 13.5 | |
| Level of Service | | | | D | D | D | A | A | | | B | |
| Approach Delay (s) | | 0.0 | | | 40.0 | | | 9.2 | | | 13.5 | |
| Approach LOS | | A | | | D | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 20.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 87.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2016 AM Alternative 2
8/4/2014

| |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  |  |  |  | |  |  |  |  |  |  |
| Volume (vph) | 14 | 5 | 44 | 55 | 10 | 5 | 113 | 875 | 50 | 5 | 1054 | 70 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.95 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1797 | 1583 | 1770 | 1770 | | 1770 | 3511 | | 1770 | 3506 | |
| Flt Permitted | | 0.82 | 1.00 | 0.75 | 1.00 | | 0.21 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | | 1521 | 1583 | 1388 | 1770 | | 400 | 3511 | | 573 | 3506 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 14 | 5 | 44 | 55 | 10 | 5 | 113 | 875 | 50 | 5 | 1054 | 70 |
| RTOR Reduction (vph) | 0 | 0 | 40 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 19 | 4 | 55 | 11 | 0 | 113 | 924 | 0 | 5 | 1122 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 9.0 | 9.0 | 9.0 | 9.0 | | 99.5 | 93.9 | | 89.3 | 88.2 | |
| Effective Green, g (s) | | 12.0 | 12.0 | 12.0 | 12.0 | | 101.5 | 96.9 | | 93.3 | 91.2 | |
| Actuated g/C Ratio | | 0.10 | 0.10 | 0.10 | 0.10 | | 0.85 | 0.81 | | 0.78 | 0.76 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 152 | 158 | 138 | 177 | | 438 | 2835 | | 476 | 2664 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.02 | 0.26 | | 0.00 | c0.32 | |
| v/s Ratio Perm | | 0.01 | 0.00 | c0.04 | | | 0.20 | | | 0.01 | | |
| v/c Ratio | | 0.12 | 0.03 | 0.40 | 0.06 | | 0.26 | 0.33 | | 0.01 | 0.42 | |
| Uniform Delay, d1 | | 49.2 | 48.7 | 50.6 | 48.9 | | 2.6 | 3.0 | | 3.0 | 5.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.48 | 1.36 | | 0.74 | 1.02 | |
| Incremental Delay, d2 | | 0.4 | 0.1 | 1.9 | 0.1 | | 0.3 | 0.3 | | 0.0 | 0.5 | |
| Delay (s) | | 49.6 | 48.8 | 52.5 | 49.0 | | 4.2 | 4.4 | | 2.2 | 5.6 | |
| Level of Service | | D | D | D | D | | A | A | | A | A | |
| Approach Delay (s) | | 49.0 | | | 51.8 | | | 4.4 | | | 5.6 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 7.7 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.41 | A |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) |
| Intersection Capacity Utilization | 57.3% | 8.0 |
| Analysis Period (min) | 15 | ICU Level of Service |
| c Critical Lane Group | | B |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2016 AM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 5 | 5 | 5 | 153 | 10 | 360 | 5 | 716 | 173 | 297 | 970 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.95 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | 1681 | 1695 | 1583 | 1770 | 3436 | | 1770 | 3534 | |
| Flt Permitted | | 0.44 | | 0.75 | 0.74 | 1.00 | 0.29 | 1.00 | | 0.25 | 1.00 | |
| Satd. Flow (perm) | | 791 | | 1323 | 1311 | 1583 | 537 | 3436 | | 465 | 3534 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 5 | 153 | 10 | 360 | 5 | 716 | 173 | 297 | 970 | 10 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 315 | 0 | 12 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 10 | 0 | 80 | 83 | 45 | 5 | 877 | 0 | 297 | 980 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 4.0 | | 13.1 | 13.1 | 13.1 | 70.6 | 69.4 | | 85.9 | 80.2 | |
| Effective Green, g (s) | | 6.0 | | 15.1 | 15.1 | 15.1 | 74.6 | 72.4 | | 87.9 | 83.2 | |
| Actuated g/C Ratio | | 0.05 | | 0.13 | 0.13 | 0.13 | 0.62 | 0.60 | | 0.73 | 0.69 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 39 | | 166 | 164 | 199 | 366 | 2073 | | 492 | 2450 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.26 | | c0.07 | 0.28 | |
| v/s Ratio Perm | | c0.01 | | 0.06 | c0.06 | 0.03 | 0.01 | | | c0.37 | | |
| v/c Ratio | | 0.26 | | 0.48 | 0.51 | 0.23 | 0.01 | 0.42 | | 0.60 | 0.40 | |
| Uniform Delay, d1 | | 54.9 | | 48.8 | 49.0 | 47.2 | 8.6 | 12.7 | | 7.3 | 7.8 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.65 | 0.68 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.6 | | 2.2 | 2.4 | 0.6 | 0.0 | 0.6 | | 2.1 | 0.5 | |
| Delay (s) | | 58.5 | | 51.0 | 51.4 | 47.8 | 5.7 | 9.2 | | 9.4 | 8.3 | |
| Level of Service | | E | | D | D | D | A | A | | A | A | |
| Approach Delay (s) | | 58.5 | | | 48.9 | | | 9.2 | | | 8.6 | |
| Approach LOS | | E | | | D | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.58 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 64.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2016 AM Alternative 2
8/4/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 30 | 45 | 984 | 1190 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 33 | 49 | 1070 | 1293 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage (veh) | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 609 | 723 | |
| pX, platoon unblocked | 0.80 | 0.75 | 0.75 | | | |
| vC, conflicting volume | 1937 | 658 | 1315 | | | |
| vC1, stage 1 conf vol | 1304 | | | | | |
| vC2, stage 2 conf vol | 633 | | | | | |
| vCu, unblocked vol | 1112 | 0 | 764 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 96 | 92 | | | |
| cM capacity (veh/h) | 296 | 817 | 636 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 5 | 33 | 49 | 535 | 535 | 862 | 453 |
| Volume Left | 5 | 0 | 49 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 33 | 0 | 0 | 0 | 0 | 22 |
| cSH | 296 | 817 | 636 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.02 | 0.04 | 0.08 | 0.31 | 0.31 | 0.51 | 0.27 |
| Queue Length 95th (ft) | 1 | 3 | 6 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 17.4 | 9.6 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | A | B | | | | |
| Approach Delay (s) | 10.7 | | 0.5 | | | 0.0 | |
| Approach LOS | B | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 0.4 | |
| Intersection Capacity Utilization | 47.4% | | ICU Level of Service A |
| Analysis Period (min) | 15 | | |

HCM Signalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2016 AM Alternative 2
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|-------|------|------|-------|-------|------|
| Lane Configurations | | ↕ | ↗ | | ↕ | ↗ | ↗ | ↕↗ | | ↗ | ↕↗ | |
| Volume (vph) | 10 | 5 | 30 | 19 | 5 | 80 | 30 | 891 | 38 | 39 | 1161 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.5 | 5.5 | | 5.5 | 5.5 | 4.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.97 | 1.00 | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1735 | 1524 | | 1725 | 1524 | 1703 | 3385 | | 1703 | 3403 | |
| Flt Permitted | | 0.78 | 1.00 | | 0.76 | 1.00 | 0.10 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | | 1397 | 1524 | | 1358 | 1524 | 186 | 3385 | | 318 | 3403 | |
| Peak-hour factor, PHF | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Adj. Flow (vph) | 14 | 7 | 41 | 26 | 7 | 110 | 41 | 1221 | 52 | 53 | 1590 | 7 |
| RTOR Reduction (vph) | 0 | 0 | 37 | 0 | 0 | 101 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 21 | 4 | 0 | 33 | 9 | 41 | 1270 | 0 | 53 | 1597 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | | 5.8 | 5.8 | | 5.8 | 5.8 | 46.6 | 44.0 | | 46.6 | 44.0 | |
| Effective Green, g (s) | | 5.8 | 5.8 | | 5.8 | 5.8 | 46.6 | 44.0 | | 46.6 | 44.0 | |
| Actuated g/C Ratio | | 0.09 | 0.09 | | 0.09 | 0.09 | 0.69 | 0.65 | | 0.69 | 0.65 | |
| Clearance Time (s) | | 5.5 | 5.5 | | 5.5 | 5.5 | 4.0 | 6.0 | | 4.0 | 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) | | 119 | 130 | | 116 | 130 | 185 | 2193 | | 271 | 2205 | |
| v/s Ratio Prot | | | | | | | c0.01 | 0.38 | | 0.01 | c0.47 | |
| v/s Ratio Perm | | 0.02 | 0.00 | | c0.02 | 0.01 | 0.14 | | | 0.13 | | |
| v/c Ratio | | 0.18 | 0.03 | | 0.28 | 0.07 | 0.22 | 0.58 | | 0.20 | 0.72 | |
| Uniform Delay, d1 | | 28.8 | 28.5 | | 29.1 | 28.6 | 5.3 | 6.7 | | 4.0 | 7.9 | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | 0.1 | | 1.4 | 0.2 | 0.6 | 0.4 | | 0.4 | 1.2 | |
| Delay (s) | | 29.5 | 28.5 | | 30.5 | 28.8 | 6.0 | 7.1 | | 4.4 | 9.1 | |
| Level of Service | | C | C | | C | C | A | A | | A | A | |
| Approach Delay (s) | | 28.9 | | | 29.2 | | | 7.1 | | | 9.0 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.65 | | |
| Actuated Cycle Length (s) | 67.9 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 53.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2016 AM Alternative 2
 5/5/2015













| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|------|-------|-------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 54 | 366 | 194 | 713 | 813 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 3.0 | 5.5 | 5.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 3406 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.16 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 293 | 3406 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 54 | 366 | 194 | 713 | 813 | 35 |
| RTOR Reduction (vph) | 0 | 215 | 0 | 0 | 0 | 12 |
| Lane Group Flow (vph) | 54 | 151 | 194 | 713 | 813 | 23 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 14.1 | 14.1 | 65.4 | 65.4 | 48.7 | 48.7 |
| Effective Green, g (s) | 14.1 | 14.1 | 65.4 | 65.4 | 48.7 | 48.7 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.75 | 0.75 | 0.56 | 0.56 |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 3.0 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 276 | 246 | 385 | 2560 | 1003 | 853 |
| v/s Ratio Prot | 0.03 | | c0.06 | 0.21 | c0.45 | |
| v/s Ratio Perm | | c0.10 | 0.32 | | | 0.01 |
| v/c Ratio | 0.20 | 0.62 | 0.50 | 0.28 | 0.81 | 0.03 |
| Uniform Delay, d1 | 31.5 | 33.9 | 10.5 | 3.4 | 15.4 | 8.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.3 | 4.5 | 1.0 | 0.1 | 5.0 | 0.0 |
| Delay (s) | 31.9 | 38.5 | 11.5 | 3.5 | 20.5 | 8.6 |
| Level of Service | C | D | B | A | C | A |
| Approach Delay (s) | 37.6 | | | 5.2 | 20.0 | |
| Approach LOS | D | | | A | B | |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 17.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 87.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 73.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2016 AM Alternative 2
 8/4/2014

| |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  | | |  |
| Volume (vph) | 135 | 435 | 360 | 0 | 0 | 878 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 147 | 473 | 391 | 0 | 0 | 954 |
| RTOR Reduction (vph) | 0 | 339 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 147 | 134 | 391 | 0 | 0 | 954 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 15.5 | 15.5 | 51.2 | | | 51.2 |
| Effective Green, g (s) | 15.5 | 15.5 | 51.2 | | | 51.2 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.66 | | | 0.66 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 353 | 315 | 1227 | | | 1227 |
| v/s Ratio Prot | 0.08 | c0.08 | 0.21 | | | c0.51 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.42 | 0.43 | 0.32 | | | 0.78 |
| Uniform Delay, d1 | 27.2 | 27.2 | 5.7 | | | 9.3 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 1.1 | 1.3 | 0.3 | | | 3.7 |
| Delay (s) | 28.2 | 28.5 | 6.0 | | | 13.0 |
| Level of Service | C | C | A | | | B |
| Approach Delay (s) | 28.4 | | 6.0 | | | 13.0 |
| Approach LOS | C | | A | | | B |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 16.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 77.7 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 62.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2016 AM Alternative 2
 8/4/2014
























| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕↔ | | ↗ | ↕ | ↘ |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 15 | 20 | 770 | 5 | 5 | 868 | 20 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 16 | 22 | 837 | 5 | 5 | 943 | 22 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1443 | 1851 | 954 | 1843 | 1859 | 421 | 965 | | | 842 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1443 | 1851 | 954 | 1843 | 1859 | 421 | 965 | | | 842 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 94 | 100 | 98 | 88 | 100 | 97 | 97 | | | 99 | | |
| cM capacity (veh/h) | 88 | 71 | 259 | 44 | 70 | 581 | 709 | | | 789 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 11 | 22 | 22 | 558 | 284 | 5 | 965 |
| Volume Left | 5 | 5 | 22 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 16 | 0 | 0 | 5 | 0 | 22 |
| cSH | 131 | 144 | 709 | 1700 | 1700 | 789 | 1700 |
| Volume to Capacity | 0.08 | 0.15 | 0.03 | 0.33 | 0.17 | 0.01 | 0.57 |
| Queue Length 95th (ft) | 7 | 13 | 2 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 35.0 | 34.4 | 10.2 | 0.0 | 0.0 | 9.6 | 0.0 |
| Lane LOS | D | D | B | | | A | |
| Approach Delay (s) | 35.0 | 34.4 | 0.3 | | | 0.1 | |
| Approach LOS | D | D | | | | | |

| Intersection Summary | |
|-----------------------------------|-------|
| Average Delay | 0.8 |
| Intersection Capacity Utilization | 56.9% |
| ICU Level of Service | B |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2016 AM Alternative 2
 8/4/2014

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  |  |  |  |  |  |  |  |
| Volume (veh/h) | 5 | 0 | 5 | 52 | 5 | 23 | 5 | 764 | 21 | 21 | 836 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 57 | 5 | 25 | 5 | 830 | 23 | 23 | 909 | 5 |
| Pedestrians | | 1 | | | 1 | | | | | | | |
| Lane Width (ft) | | 12.0 | | | 12.0 | | | | | | | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | | | | | | | |
| Percent Blockage | | 0 | | | 0 | | | | | | | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1812 | 1798 | 910 | 1802 | 1803 | 831 | 915 | | | 831 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1812 | 1798 | 910 | 1802 | 1803 | 831 | 915 | | | 831 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 90 | 100 | 98 | 4 | 93 | 93 | 99 | | | 97 | | |
| cM capacity (veh/h) | 52 | 77 | 333 | 59 | 76 | 369 | 744 | | | 800 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 | | | | |
| Volume Total | 11 | 87 | 5 | 830 | 23 | 23 | 909 | 5 | | | | |
| Volume Left | 5 | 57 | 5 | 0 | 0 | 23 | 0 | 0 | | | | |
| Volume Right | 5 | 25 | 0 | 0 | 23 | 0 | 0 | 5 | | | | |
| cSH | 90 | 83 | 744 | 1700 | 1700 | 800 | 1700 | 1700 | | | | |
| Volume to Capacity | 0.12 | 1.05 | 0.01 | 0.49 | 0.01 | 0.03 | 0.53 | 0.00 | | | | |
| Queue Length 95th (ft) | 10 | 150 | 1 | 0 | 0 | 2 | 0 | 0 | | | | |
| Control Delay (s) | 50.5 | 205.1 | 9.9 | 0.0 | 0.0 | 9.6 | 0.0 | 0.0 | | | | |
| Lane LOS | F | F | A | | | A | | | | | | |
| Approach Delay (s) | 50.5 | 205.1 | 0.1 | | | 0.2 | | | | | | |
| Approach LOS | F | F | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 9.9 | | | | | | | | | |
| Intersection Capacity Utilization | | | 56.9% | ICU Level of Service | | | | | | | B | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
1: MD 108 & Church Ent./Guildford Rd.

2016 PM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 0 | 5 | 10 | 0 | 40 | 0 | 898 | 25 | 100 | 692 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.95 | 1.00 | | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | | | 1770 | 1583 | | 1855 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.77 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.14 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1433 | 1583 | | | 1863 | 1583 | | 1855 | | 265 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 0 | 5 | 10 | 0 | 40 | 0 | 898 | 25 | 100 | 692 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Lane Group Flow (vph) | 30 | 1 | 0 | 0 | 10 | 40 | 0 | 923 | 0 | 100 | 692 | 12 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 8.2 | 8.2 | | | 1.2 | 73.2 | | 44.7 | | 55.0 | 55.0 | 55.0 |
| Effective Green, g (s) | 10.2 | 10.2 | | | 3.2 | 73.2 | | 46.7 | | 57.0 | 57.0 | 57.0 |
| Actuated g/C Ratio | 0.14 | 0.14 | | | 0.04 | 1.00 | | 0.64 | | 0.78 | 0.78 | 0.78 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 222 | 220 | | | 81 | 1583 | | 1183 | | 356 | 1450 | 1232 |
| v/s Ratio Prot | c0.01 | 0.00 | | | | | | c0.50 | | 0.03 | c0.37 | |
| v/s Ratio Perm | 0.01 | | | | 0.01 | 0.03 | | | | 0.19 | | 0.01 |
| v/c Ratio | 0.14 | 0.00 | | | 0.12 | 0.03 | | 0.78 | | 0.28 | 0.48 | 0.01 |
| Uniform Delay, d1 | 27.6 | 27.1 | | | 33.7 | 0.0 | | 9.5 | | 8.3 | 2.9 | 1.8 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.3 | 0.0 | | | 0.7 | 0.0 | | 4.2 | | 0.4 | 0.7 | 0.0 |
| Delay (s) | 27.9 | 27.1 | | | 34.3 | 0.0 | | 13.8 | | 8.7 | 3.6 | 1.8 |
| Level of Service | C | C | | | C | A | | B | | A | A | A |
| Approach Delay (s) | | 27.8 | | | 6.9 | | | 13.8 | | | 4.2 | |
| Approach LOS | | C | | | A | | | B | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 9.6 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.67 | A |
| Actuated Cycle Length (s) | 73.2 | Sum of lost time (s) |
| Intersection Capacity Utilization | 72.6% | 11.0 |
| Analysis Period (min) | 15 | ICU Level of Service |
| c Critical Lane Group | | C |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

2016 PM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 502 | 10 | 40 | 5 | 5 | 5 | 75 | 913 | 10 | 10 | 787 | 1042 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1688 | 1583 | | 1750 | | 1770 | 1860 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.16 | 1.00 | | | 0.99 | 1.00 |
| Satd. Flow (perm) | 1681 | 1688 | 1583 | | 1750 | | 298 | 1860 | | | 1838 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 502 | 10 | 40 | 5 | 5 | 5 | 75 | 913 | 10 | 10 | 787 | 1042 |
| RTOR Reduction (vph) | 0 | 0 | 32 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 307 |
| Lane Group Flow (vph) | 251 | 261 | 8 | 0 | 10 | 0 | 75 | 923 | 0 | 0 | 797 | 735 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 28.0 | 28.0 | 28.0 | | 11.1 | | 94.9 | 94.9 | | | 86.9 | 86.9 |
| Effective Green, g (s) | 30.0 | 30.0 | 30.0 | | 13.1 | | 92.4 | 96.9 | | | 89.9 | 89.9 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.20 | | 0.09 | | 0.62 | 0.65 | | | 0.60 | 0.60 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.5 | 3.5 | 3.5 | | 3.0 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 336 | 337 | 316 | | 152 | | 271 | 1201 | | | 1101 | 948 |
| v/s Ratio Prot | 0.15 | c0.15 | | | c0.01 | | 0.02 | c0.50 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.15 | | | | 0.43 | c0.46 |
| v/c Ratio | 0.75 | 0.77 | 0.03 | | 0.07 | | 0.28 | 0.77 | | | 0.72 | 0.77 |
| Uniform Delay, d1 | 56.4 | 56.8 | 48.2 | | 62.8 | | 19.7 | 18.7 | | | 21.3 | 22.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.02 | 1.99 |
| Incremental Delay, d2 | 9.0 | 10.9 | 0.0 | | 0.2 | | 0.6 | 3.0 | | | 0.7 | 1.4 |
| Delay (s) | 65.5 | 67.7 | 48.3 | | 63.0 | | 20.3 | 21.7 | | | 1.1 | 46.2 |
| Level of Service | E | E | D | | E | | C | C | | | A | D |
| Approach Delay (s) | | 65.3 | | | 63.0 | | | 21.6 | | | 26.7 | |
| Approach LOS | | E | | | E | | | C | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 31.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 126.9% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

3: MD 108 & MD32 EB Ramps

2016 PM Alternative 2

8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|--------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 145 | 5 | 41 | 0 | 0 | 0 | 0 | 846 | 574 | 343 | 1798 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.93 | | | | | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1610 | | | | | | 1770 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.06 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1610 | | | | | | 1770 | 1504 | 116 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 145 | 5 | 41 | 0 | 0 | 0 | 0 | 846 | 574 | 343 | 1798 | 0 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 100 | 72 | 0 | 0 | 0 | 0 | 0 | 846 | 443 | 343 | 1798 | 0 |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | |
| Actuated Green, G (s) | 11.1 | 11.1 | | | | | | 97.4 | 95.9 | 89.9 | 78.4 | |
| Effective Green, g (s) | 13.1 | 13.1 | | | | | | 96.9 | 100.4 | 91.9 | 81.4 | |
| Actuated g/C Ratio | 0.09 | 0.09 | | | | | | 0.65 | 0.67 | 0.61 | 0.54 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | | | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | 146 | 140 | | | | | | 1143 | 1006 | 374 | 1920 | |
| v/s Ratio Prot | | | | | | | | c0.48 | | c0.17 | c0.51 | |
| v/s Ratio Perm | c0.06 | 0.04 | | | | | | | 0.29 | 0.39 | | |
| v/c Ratio | 0.68 | 0.51 | | | | | | 0.74 | 0.44 | 0.92 | 0.94 | |
| Uniform Delay, d1 | 66.4 | 65.4 | | | | | | 18.0 | 11.6 | 49.0 | 31.9 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.57 | 0.70 | 1.44 | 0.75 | |
| Incremental Delay, d2 | 12.5 | 3.2 | | | | | | 1.8 | 0.2 | 20.0 | 6.7 | |
| Delay (s) | 79.0 | 68.6 | | | | | | 12.1 | 8.4 | 90.6 | 30.7 | |
| Level of Service | E | E | | | | | | B | A | F | C | |
| Approach Delay (s) | | 74.0 | | | 0.0 | | | 10.6 | | | 40.3 | |
| Approach LOS | | E | | | A | | | B | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 30.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.89 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 91.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

2016 PM Alternative 2

8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↗ | ↖ | ↖ | ↕ | | | ↕ | ↗ |
| Volume (vph) | 0 | 0 | 0 | 1023 | 10 | 487 | 46 | 945 | 0 | 0 | 1118 | 154 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | 2.5 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Frt | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.98 | |
| Flt Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1687 | 1583 | 1770 | 3539 | | | 3475 | |
| Flt Permitted | | | | 0.95 | 0.95 | 1.00 | 0.10 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1687 | 1583 | 183 | 3539 | | | 3475 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 1023 | 10 | 487 | 46 | 945 | 0 | 0 | 1118 | 154 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 511 | 522 | 487 | 46 | 945 | 0 | 0 | 1265 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 16 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 52.5 | 52.5 | 52.5 | 81.0 | 86.5 | | | 72.5 | |
| Effective Green, g (s) | | | | 55.5 | 55.5 | 55.5 | 87.0 | 89.5 | | | 75.5 | |
| Actuated g/C Ratio | | | | 0.37 | 0.37 | 0.37 | 0.58 | 0.60 | | | 0.50 | |
| Clearance Time (s) | | | | 5.5 | 5.5 | 5.5 | 5.5 | | | | 5.5 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 621 | 624 | 585 | 227 | 2111 | | | 1749 | |
| v/s Ratio Prot | | | | | | | 0.02 | c0.27 | | | c0.36 | |
| v/s Ratio Perm | | | | 0.30 | 0.31 | 0.31 | 0.10 | | | | | |
| v/c Ratio | | | | 0.82 | 0.84 | 0.83 | 0.20 | 0.45 | | | 0.72 | |
| Uniform Delay, d1 | | | | 42.8 | 43.1 | 43.0 | 41.1 | 16.6 | | | 29.1 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.22 | 0.57 | | | 0.75 | |
| Incremental Delay, d2 | | | | 8.6 | 9.5 | 9.8 | 0.3 | 0.1 | | | 2.5 | |
| Delay (s) | | | | 51.4 | 52.6 | 52.9 | 9.3 | 9.5 | | | 24.3 | |
| Level of Service | | | | D | D | D | A | A | | | C | |
| Approach Delay (s) | | 0.0 | | | 52.3 | | | 9.5 | | | 24.3 | |
| Approach LOS | | A | | | D | | | A | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|-----|
| HCM 2000 Control Delay | 31.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 7.5 |
| Intersection Capacity Utilization | 132.1% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2016 PM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|-------|------|-------|-------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↖↗ | | ↖ | ↖↗ | |
| Volume (vph) | 91 | 20 | 178 | 90 | 15 | 20 | 113 | 1249 | 70 | 10 | 1004 | 64 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.91 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1789 | 1583 | 1770 | 1703 | | 1770 | 3511 | | 1770 | 3507 | |
| Flt Permitted | | 0.74 | 1.00 | 0.50 | 1.00 | | 0.23 | 1.00 | | 0.18 | 1.00 | |
| Satd. Flow (perm) | | 1379 | 1583 | 940 | 1703 | | 423 | 3511 | | 341 | 3507 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 91 | 20 | 178 | 90 | 15 | 20 | 113 | 1249 | 70 | 10 | 1004 | 64 |
| RTOR Reduction (vph) | 0 | 0 | 153 | 0 | 17 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 111 | 25 | 90 | 18 | 0 | 113 | 1318 | 0 | 10 | 1066 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | 8 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 17.8 | 17.8 | 17.8 | 17.8 | | 120.7 | 113.8 | | 111.2 | 108.8 | |
| Effective Green, g (s) | | 20.8 | 20.8 | 20.8 | 20.8 | | 122.7 | 116.8 | | 115.2 | 111.8 | |
| Actuated g/C Ratio | | 0.14 | 0.14 | 0.14 | 0.14 | | 0.82 | 0.78 | | 0.77 | 0.75 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 191 | 219 | 130 | 236 | | 430 | 2733 | | 303 | 2613 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.02 | c0.38 | | 0.00 | 0.30 | |
| v/s Ratio Perm | | 0.08 | 0.02 | c0.10 | | | 0.20 | | | 0.02 | | |
| v/c Ratio | | 0.58 | 0.11 | 0.69 | 0.08 | | 0.26 | 0.48 | | 0.03 | 0.41 | |
| Uniform Delay, d1 | | 60.5 | 56.5 | 61.6 | 56.2 | | 4.0 | 5.9 | | 4.7 | 7.0 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 0.77 | 0.80 | | 1.13 | 1.61 | |
| Incremental Delay, d2 | | 4.4 | 0.2 | 14.8 | 0.1 | | 0.3 | 0.5 | | 0.0 | 0.4 | |
| Delay (s) | | 65.0 | 56.8 | 76.3 | 56.4 | | 3.3 | 5.2 | | 5.3 | 11.7 | |
| Level of Service | | E | E | E | E | | A | A | | A | B | |
| Approach Delay (s) | | 59.9 | | | 70.7 | | | 5.1 | | | 11.6 | |
| Approach LOS | | E | | | E | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 15.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 63.7% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2016 PM Alternative 2

8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 25 | 20 | 10 | 288 | 20 | 518 | 15 | 1081 | 247 | 277 | 769 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.98 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1777 | | 1681 | 1695 | 1583 | 1770 | 3440 | | 1770 | 3526 | |
| Flt Permitted | | 0.18 | | 0.72 | 0.71 | 1.00 | 0.35 | 1.00 | | 0.07 | 1.00 | |
| Satd. Flow (perm) | | 327 | | 1276 | 1262 | 1583 | 658 | 3440 | | 129 | 3526 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 25 | 20 | 10 | 288 | 20 | 518 | 15 | 1081 | 247 | 277 | 769 | 20 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 333 | 0 | 12 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 50 | 0 | 144 | 164 | 185 | 15 | 1316 | 0 | 277 | 788 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 16.5 | | 22.3 | 22.3 | 22.3 | 71.7 | 69.1 | | 94.2 | 87.1 | |
| Effective Green, g (s) | | 18.5 | | 24.3 | 24.3 | 24.3 | 75.7 | 72.1 | | 96.2 | 90.1 | |
| Actuated g/C Ratio | | 0.12 | | 0.16 | 0.16 | 0.16 | 0.50 | 0.48 | | 0.64 | 0.60 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 40 | | 206 | 204 | 256 | 366 | 1653 | | 329 | 2117 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.38 | | c0.13 | 0.22 | |
| v/s Ratio Perm | | c0.15 | | 0.11 | c0.13 | 0.12 | 0.02 | | | c0.41 | | |
| v/c Ratio | | 1.24 | | 0.70 | 0.80 | 0.72 | 0.04 | 0.80 | | 0.84 | 0.37 | |
| Uniform Delay, d1 | | 65.8 | | 59.4 | 60.6 | 59.7 | 18.6 | 32.8 | | 44.4 | 15.4 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.65 | 0.77 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 222.7 | | 9.9 | 20.0 | 9.7 | 0.0 | 3.8 | | 17.4 | 0.5 | |
| Delay (s) | | 288.4 | | 69.3 | 80.6 | 69.4 | 12.1 | 29.0 | | 61.8 | 15.9 | |
| Level of Service | | F | | E | F | E | B | C | | E | B | |
| Approach Delay (s) | | 288.4 | | | 71.6 | | | 28.8 | | | 27.8 | |
| Approach LOS | | F | | | E | | | C | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 43.6 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 86.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2016 PM Alternative 2
8/4/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 45 | 100 | 105 | 1495 | 941 | 50 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 109 | 114 | 1625 | 1023 | 54 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage (veh) | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 620 | 714 | |
| pX, platoon unblocked | 0.74 | 0.90 | 0.90 | | | |
| vC, conflicting volume | 2091 | 539 | 1077 | | | |
| vC1, stage 1 conf vol | 1050 | | | | | |
| vC2, stage 2 conf vol | 1041 | | | | | |
| vCu, unblocked vol | 1200 | 279 | 874 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 83 | 83 | 84 | | | |
| cM capacity (veh/h) | 292 | 650 | 694 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 49 | 109 | 114 | 812 | 812 | 682 | 395 |
| Volume Left | 49 | 0 | 114 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 109 | 0 | 0 | 0 | 0 | 54 |
| cSH | 292 | 650 | 694 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.17 | 0.17 | 0.16 | 0.48 | 0.48 | 0.40 | 0.23 |
| Queue Length 95th (ft) | 15 | 15 | 15 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 19.8 | 11.7 | 11.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | B | B | | | | |
| Approach Delay (s) | 14.2 | | 0.7 | | | 0.0 | |
| Approach LOS | B | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|----------------------|---|
| Average Delay | | 1.2 | |
| Intersection Capacity Utilization | 51.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Signalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2016 PM Alternative 2
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|-------|-------|-------|------|-------|-------|------|
| Lane Configurations | | ↕ | ↗ | | ↕ | ↗ | ↗ | ↕↗ | | ↗ | ↕↗ | |
| Volume (vph) | 25 | 5 | 80 | 24 | 5 | 124 | 55 | 1374 | 71 | 88 | 842 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 5.5 | 5.5 | | 5.5 | 5.5 | 4.0 | 6.0 | | 4.0 | 6.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1721 | 1524 | | 1721 | 1524 | 1703 | 3381 | | 1703 | 3382 | |
| Flt Permitted | | 0.73 | 1.00 | | 0.74 | 1.00 | 0.22 | 1.00 | | 0.06 | 1.00 | |
| Satd. Flow (perm) | | 1317 | 1524 | | 1318 | 1524 | 386 | 3381 | | 105 | 3382 | |
| Peak-hour factor, PHF | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Adj. Flow (vph) | 34 | 7 | 110 | 33 | 7 | 170 | 75 | 1882 | 97 | 121 | 1153 | 55 |
| RTOR Reduction (vph) | 0 | 0 | 101 | 0 | 0 | 103 | 0 | 2 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 41 | 9 | 0 | 40 | 67 | 75 | 1977 | 0 | 121 | 1206 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | | 11.6 | 11.6 | | 11.6 | 11.6 | 111.0 | 105.1 | | 119.1 | 109.2 | |
| Effective Green, g (s) | | 11.6 | 11.6 | | 11.6 | 11.6 | 111.0 | 105.1 | | 119.1 | 109.2 | |
| Actuated g/C Ratio | | 0.08 | 0.08 | | 0.08 | 0.08 | 0.78 | 0.74 | | 0.84 | 0.77 | |
| Clearance Time (s) | | 5.5 | 5.5 | | 5.5 | 5.5 | 4.0 | 6.0 | | 4.0 | 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) | | 107 | 124 | | 107 | 124 | 355 | 2498 | | 200 | 2597 | |
| v/s Ratio Prot | | | | | | | 0.01 | c0.58 | | c0.04 | 0.36 | |
| v/s Ratio Perm | | 0.03 | 0.01 | | 0.03 | c0.04 | 0.16 | | | 0.46 | | |
| v/c Ratio | | 0.38 | 0.07 | | 0.37 | 0.54 | 0.21 | 0.79 | | 0.60 | 0.46 | |
| Uniform Delay, d1 | | 61.9 | 60.3 | | 61.9 | 62.7 | 3.8 | 11.7 | | 26.5 | 6.0 | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.3 | 0.2 | | 2.2 | 4.8 | 0.3 | 2.7 | | 5.1 | 0.6 | |
| Delay (s) | | 64.2 | 60.6 | | 64.1 | 67.5 | 4.1 | 14.3 | | 31.6 | 6.6 | |
| Level of Service | | E | E | | E | E | A | B | | C | A | |
| Approach Delay (s) | | 61.6 | | | 66.8 | | | 13.9 | | | 8.8 | |
| Approach LOS | | E | | | E | | | B | | | A | |

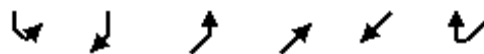
Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 17.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 142.2 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 66.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: MD 108 & Sheppard Lane

2016 PM Alternative 2
5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|-------|------|-------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 39 | 185 | 502 | 972 | 748 | 65 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 3406 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.10 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 184 | 3406 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 39 | 185 | 502 | 972 | 748 | 65 |
| RTOR Reduction (vph) | 0 | 167 | 0 | 0 | 0 | 32 |
| Lane Group Flow (vph) | 39 | 18 | 502 | 972 | 748 | 33 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 9.4 | 9.4 | 78.7 | 78.7 | 45.3 | 45.3 |
| Effective Green, g (s) | 9.4 | 9.4 | 78.7 | 78.7 | 45.3 | 45.3 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.80 | 0.80 | 0.46 | 0.46 |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 163 | 146 | 602 | 2732 | 827 | 703 |
| v/s Ratio Prot | c0.02 | | c0.25 | 0.29 | c0.42 | |
| v/s Ratio Perm | | 0.01 | 0.42 | | | 0.02 |
| v/c Ratio | 0.24 | 0.12 | 0.83 | 0.36 | 0.90 | 0.05 |
| Uniform Delay, d1 | 41.0 | 40.6 | 24.7 | 2.7 | 24.4 | 14.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.8 | 0.4 | 9.7 | 0.1 | 13.2 | 0.0 |
| Delay (s) | 41.8 | 40.9 | 34.4 | 2.8 | 37.6 | 14.5 |
| Level of Service | D | D | C | A | D | B |
| Approach Delay (s) | 41.1 | | | 13.5 | 35.8 | |
| Approach LOS | D | | | B | D | |











Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 23.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.81 | | |
| Actuated Cycle Length (s) | 98.1 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 85.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2016 PM Alternative 2
 8/4/2014

| |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  | | |  |
| Volume (vph) | 10 | 25 | 981 | 0 | 0 | 829 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 27 | 1066 | 0 | 0 | 901 |
| RTOR Reduction (vph) | 0 | 26 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 1 | 1066 | 0 | 0 | 901 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 4.7 | 4.7 | 72.8 | | | 72.8 |
| Effective Green, g (s) | 4.7 | 4.7 | 72.8 | | | 72.8 |
| Actuated g/C Ratio | 0.05 | 0.05 | 0.82 | | | 0.82 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 94 | 84 | 1532 | | | 1532 |
| v/s Ratio Prot | c0.01 | 0.00 | c0.57 | | | 0.48 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.12 | 0.02 | 0.70 | | | 0.59 |
| Uniform Delay, d1 | 39.9 | 39.7 | 3.3 | | | 2.7 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 0.8 | 0.1 | 1.8 | | | 0.9 |
| Delay (s) | 40.7 | 39.8 | 5.0 | | | 3.6 |
| Level of Service | D | D | A | | | A |
| Approach Delay (s) | 40.1 | | 5.0 | | | 3.6 |
| Approach LOS | D | | A | | | A |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 5.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 88.5 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 67.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2016 PM Alternative 2
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕↔ | | ↕ | ↔ | |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 986 | 15 | 5 | 819 | 25 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 1072 | 16 | 5 | 890 | 27 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1467 | 2014 | 904 | 1997 | 2019 | 544 | 917 | | | 1088 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1467 | 2014 | 904 | 1997 | 2019 | 544 | 917 | | | 1088 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 94 | 100 | 98 | 84 | 100 | 99 | 99 | | | 99 | | |
| cM capacity (veh/h) | 87 | 57 | 280 | 34 | 57 | 483 | 739 | | | 637 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 11 | 11 | 5 | 714 | 374 | 5 | 917 |
| Volume Left | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 5 | 0 | 0 | 16 | 0 | 27 |
| cSH | 133 | 64 | 739 | 1700 | 1700 | 637 | 1700 |
| Volume to Capacity | 0.08 | 0.17 | 0.01 | 0.42 | 0.22 | 0.01 | 0.54 |
| Queue Length 95th (ft) | 7 | 14 | 1 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 34.5 | 72.2 | 9.9 | 0.0 | 0.0 | 10.7 | 0.0 |
| Lane LOS | D | F | A | | | B | |
| Approach Delay (s) | 34.5 | 72.2 | 0.0 | | | 0.1 | |
| Approach LOS | D | F | | | | | |

| Intersection Summary | | |
|-----------------------------------|-------|----------------------|
| Average Delay | | 0.6 |
| Intersection Capacity Utilization | 54.6% | ICU Level of Service |
| Analysis Period (min) | | 15 |
| | | A |

HCM Unsignalized Intersection Capacity Analysis
12: MD 108 & Meadow Vista Way/Trotter Road

2016 PM Alternative 2
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↔ | ↔ | ↑ | ↔ | ↔ | ↑ | ↔ |
| Volume (veh/h) | 5 | 5 | 0 | 49 | 5 | 47 | 5 | 939 | 52 | 23 | 800 | 10 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 53 | 5 | 51 | 5 | 1021 | 57 | 25 | 870 | 11 |
| Pedestrians | | | | | 1 | | | | | | 1 | |
| Lane Width (ft) | | | | | 12.0 | | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | | | | | | 4.0 | |
| Percent Blockage | | | | | 0 | | | | | | 0 | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1980 | 1952 | 870 | 1955 | 1963 | 1023 | 880 | | | 1022 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1980 | 1952 | 870 | 1955 | 1963 | 1023 | 880 | | | 1022 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 84 | 91 | 100 | 0 | 91 | 82 | 99 | | | 96 | | |
| cM capacity (veh/h) | 34 | 61 | 351 | 43 | 60 | 286 | 768 | | | 679 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|-------|-------|------|------|------|------|------|------|
| Volume Total | 11 | 110 | 5 | 1021 | 57 | 25 | 870 | 11 |
| Volume Left | 5 | 53 | 5 | 0 | 0 | 25 | 0 | 0 |
| Volume Right | 0 | 51 | 0 | 0 | 57 | 0 | 0 | 11 |
| cSH | 44 | 78 | 768 | 1700 | 1700 | 679 | 1700 | 1700 |
| Volume to Capacity | 0.25 | 1.41 | 0.01 | 0.60 | 0.03 | 0.04 | 0.51 | 0.01 |
| Queue Length 95th (ft) | 21 | 218 | 1 | 0 | 0 | 3 | 0 | 0 |
| Control Delay (s) | 112.6 | 339.0 | 9.7 | 0.0 | 0.0 | 10.5 | 0.0 | 0.0 |
| Lane LOS | F | F | A | | | B | | |
| Approach Delay (s) | 112.6 | 339.0 | 0.0 | | | 0.3 | | |
| Approach LOS | F | F | | | | | | |

Intersection Summary

| | |
|-----------------------------------|-------|
| Average Delay | 18.4 |
| Intersection Capacity Utilization | 66.4% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

2035 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|-------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 5 | 5 | 10 | 49 | 10 | 138 | 5 | 919 | 33 | 97 | 991 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.90 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1676 | | | 1788 | 1583 | 1770 | 1853 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.60 | 1.00 | | | 0.75 | 1.00 | 0.23 | 1.00 | | 0.11 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1110 | 1676 | | | 1405 | 1583 | 429 | 1853 | | 196 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 10 | 49 | 10 | 138 | 5 | 919 | 33 | 97 | 991 | 20 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 5 |
| Lane Group Flow (vph) | 5 | 7 | 0 | 0 | 59 | 138 | 5 | 951 | 0 | 97 | 991 | 15 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 12.7 | 12.7 | | | 7.7 | 80.5 | 47.4 | 47.4 | | 57.8 | 57.8 | 57.8 |
| Effective Green, g (s) | 14.7 | 14.7 | | | 9.7 | 80.5 | 49.4 | 49.4 | | 59.8 | 59.8 | 59.8 |
| Actuated g/C Ratio | 0.18 | 0.18 | | | 0.12 | 1.00 | 0.61 | 0.61 | | 0.74 | 0.74 | 0.74 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 227 | 306 | | | 169 | 1583 | 263 | 1137 | | 290 | 1383 | 1175 |
| v/s Ratio Prot | 0.00 | 0.00 | | | | | | c0.51 | | 0.03 | c0.53 | |
| v/s Ratio Perm | 0.00 | | | | c0.04 | c0.09 | 0.01 | | | 0.22 | | 0.01 |
| v/c Ratio | 0.02 | 0.02 | | | 0.35 | 0.09 | 0.02 | 0.84 | | 0.33 | 0.72 | 0.01 |
| Uniform Delay, d1 | 27.0 | 27.0 | | | 32.5 | 0.0 | 6.1 | 12.3 | | 11.9 | 5.7 | 2.7 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.0 | 0.0 | | | 1.3 | 0.1 | 0.1 | 6.4 | | 0.7 | 2.6 | 0.0 |
| Delay (s) | 27.0 | 27.0 | | | 33.8 | 0.1 | 6.2 | 18.7 | | 12.6 | 8.3 | 2.7 |
| Level of Service | C | C | | | C | A | A | B | | B | A | A |
| Approach Delay (s) | | 27.0 | | | 10.2 | | | 18.7 | | | 8.6 | |
| Approach LOS | | C | | | B | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 13.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 80.5 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 88.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
 2: MD 108 & Ten Oaks. Rd./Gas Sta.

2035 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 937 | 10 | 79 | 5 | 5 | 5 | 43 | 1058 | 10 | 5 | 1068 | 508 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1687 | 1583 | | 1750 | | 1770 | 1860 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.07 | 1.00 | | | 0.73 | 1.00 |
| Satd. Flow (perm) | 1681 | 1687 | 1583 | | 1750 | | 137 | 1860 | | | 1369 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 937 | 10 | 79 | 5 | 5 | 5 | 43 | 1058 | 10 | 5 | 1068 | 508 |
| RTOR Reduction (vph) | 0 | 0 | 57 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 143 |
| Lane Group Flow (vph) | 468 | 479 | 22 | 0 | 10 | 0 | 43 | 1068 | 0 | 0 | 1073 | 365 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 32.0 | 32.0 | 32.0 | | 7.5 | | 64.5 | 64.5 | | | 58.0 | 58.0 |
| Effective Green, g (s) | 34.0 | 34.0 | 34.0 | | 9.5 | | 62.0 | 66.5 | | | 61.0 | 61.0 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | | 0.08 | | 0.52 | 0.55 | | | 0.51 | 0.51 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 476 | 477 | 448 | | 138 | | 172 | 1030 | | | 695 | 804 |
| v/s Ratio Prot | 0.28 | c0.28 | | | c0.01 | | 0.02 | c0.57 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.11 | | | | c0.78 | 0.23 |
| v/c Ratio | 0.98 | 1.00 | 0.05 | | 0.08 | | 0.25 | 1.04 | | | 1.54 | 0.45 |
| Uniform Delay, d1 | 42.7 | 43.0 | 31.3 | | 51.2 | | 25.2 | 26.8 | | | 29.5 | 18.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.23 | 0.00 |
| Incremental Delay, d2 | 36.6 | 42.2 | 0.0 | | 0.2 | | 0.8 | 37.9 | | | 246.6 | 0.1 |
| Delay (s) | 79.4 | 85.2 | 31.3 | | 51.4 | | 26.0 | 64.7 | | | 253.3 | 0.1 |
| Level of Service | E | F | C | | D | | C | E | | | F | A |
| Approach Delay (s) | | 78.4 | | | 51.4 | | | 63.2 | | | 171.9 | |
| Approach LOS | | E | | | D | | | E | | | F | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 113.4 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.26 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 101.5% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

3: MD 108 & MD32 EB Ramps

2035 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|------|------|------|------|-------|--------|-------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 227 | 5 | 54 | 0 | 0 | 0 | 0 | 970 | 1030 | 459 | 1527 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.94 | | | | | | 0.97 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1617 | | | | | | 1712 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.11 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1617 | | | | | | 1712 | 1504 | 207 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 227 | 5 | 54 | 0 | 0 | 0 | 0 | 970 | 1030 | 459 | 1527 | 0 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 9 | 128 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 152 | 114 | 0 | 0 | 0 | 0 | 0 | 1229 | 634 | 459 | 1527 | 0 |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 | 6 | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 | 6 | 9 | 2 |
| Actuated Green, G (s) | 7.5 | 7.5 | | | | | | 74.0 | 73.5 | 58.5 | 48.5 | |
| Effective Green, g (s) | 9.5 | 9.5 | | | | | | 73.5 | 77.0 | 60.5 | 51.5 | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.61 | 0.64 | 0.50 | 0.43 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 2.5 | 2.5 | | | | | | | | 2.5 | 5.0 | |
| Lane Grp Cap (vph) | 133 | 128 | | | | | | 1048 | 965 | 423 | 1518 | |
| v/s Ratio Prot | | | | | | | | c0.72 | | c0.22 | 0.43 | |
| v/s Ratio Perm | c0.09 | 0.07 | | | | | | | 0.42 | 0.33 | | |
| v/c Ratio | 1.14 | 0.89 | | | | | | 1.17 | 0.66 | 1.09 | 1.01 | |
| Uniform Delay, d1 | 55.2 | 54.7 | | | | | | 23.2 | 13.3 | 36.9 | 34.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.67 | 0.37 | 1.64 | 1.14 | |
| Incremental Delay, d2 | 121.5 | 46.7 | | | | | | 78.8 | 0.1 | 52.4 | 19.3 | |
| Delay (s) | 176.8 | 101.4 | | | | | | 94.3 | 5.1 | 112.8 | 58.3 | |
| Level of Service | F | F | | | | | | F | A | F | E | |
| Approach Delay (s) | | 141.5 | | | 0.0 | | | 60.3 | | | 70.9 | |
| Approach LOS | | F | | | A | | | E | | | E | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 70.7 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.18 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 115.9% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

2035 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|-------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↖ | ↖ | ↖ | ↕ | | | ↕ | ↗ |
| Volume (vph) | 0 | 0 | 0 | 495 | 0 | 399 | 68 | 1129 | 0 | 0 | 1491 | 154 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Frt | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.99 | |
| Flt Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1681 | 1583 | 1770 | 3539 | | | 3490 | |
| Flt Permitted | | | | 0.95 | 0.95 | 1.00 | 0.07 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1681 | 1583 | 123 | 3539 | | | 3490 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 495 | 0 | 399 | 68 | 1129 | 0 | 0 | 1491 | 154 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 247 | 248 | 399 | 68 | 1129 | 0 | 0 | 1639 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 34.8 | 34.8 | 34.8 | 67.2 | 73.2 | | | 57.4 | |
| Effective Green, g (s) | | | | 37.8 | 37.8 | 37.8 | 73.2 | 76.2 | | | 60.4 | |
| Actuated g/C Ratio | | | | 0.31 | 0.31 | 0.31 | 0.61 | 0.64 | | | 0.50 | |
| Clearance Time (s) | | | | 6.0 | 6.0 | 6.0 | 6.0 | | | | 6.0 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 529 | 529 | 498 | 250 | 2247 | | | 1756 | |
| v/s Ratio Prot | | | | | | | 0.03 | c0.32 | | | c0.47 | |
| v/s Ratio Perm | | | | 0.15 | 0.15 | c0.25 | 0.14 | | | | | |
| v/c Ratio | | | | 0.47 | 0.47 | 0.80 | 0.27 | 0.50 | | | 0.93 | |
| Uniform Delay, d1 | | | | 33.0 | 33.0 | 37.7 | 44.2 | 11.7 | | | 27.9 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.29 | 0.77 | | | 0.78 | |
| Incremental Delay, d2 | | | | 0.7 | 0.7 | 9.0 | 0.1 | 0.0 | | | 8.4 | |
| Delay (s) | | | | 33.7 | 33.7 | 46.7 | 12.7 | 9.0 | | | 30.3 | |
| Level of Service | | | | C | C | D | B | A | | | C | |
| Approach Delay (s) | | 0.0 | | | 39.5 | | | 9.2 | | | 30.3 | |
| Approach LOS | | A | | | D | | | A | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|-----|
| HCM 2000 Control Delay | 25.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.85 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 9.0 |
| Intersection Capacity Utilization | 115.9% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2035 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|------|------|-------|-------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 67 | 5 | 44 | 73 | 10 | 26 | 212 | 1203 | 113 | 81 | 1528 | 126 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1780 | 1583 | 1770 | 1661 | | 1770 | 3494 | | 1770 | 3499 | |
| Flt Permitted | | 0.71 | 1.00 | 0.64 | 1.00 | | 0.08 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | | 1331 | 1583 | 1188 | 1661 | | 153 | 3494 | | 359 | 3499 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 5 | 44 | 73 | 10 | 26 | 212 | 1203 | 113 | 81 | 1528 | 126 |
| RTOR Reduction (vph) | 0 | 0 | 39 | 0 | 23 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 72 | 5 | 73 | 13 | 0 | 212 | 1313 | 0 | 81 | 1650 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 10.9 | 10.9 | 10.9 | 10.9 | | 97.6 | 87.6 | | 83.4 | 77.9 | |
| Effective Green, g (s) | | 13.9 | 13.9 | 13.9 | 13.9 | | 99.6 | 90.6 | | 87.4 | 80.9 | |
| Actuated g/C Ratio | | 0.12 | 0.12 | 0.12 | 0.12 | | 0.83 | 0.75 | | 0.73 | 0.67 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 154 | 183 | 137 | 192 | | 358 | 2637 | | 349 | 2358 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.08 | 0.38 | | 0.01 | c0.47 | |
| v/s Ratio Perm | | 0.05 | 0.00 | c0.06 | | | 0.40 | | | 0.15 | | |
| v/c Ratio | | 0.47 | 0.03 | 0.53 | 0.07 | | 0.59 | 0.50 | | 0.23 | 0.70 | |
| Uniform Delay, d1 | | 49.6 | 47.1 | 50.0 | 47.3 | | 23.6 | 5.8 | | 4.8 | 12.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.58 | 0.77 | | 1.05 | 1.12 | |
| Incremental Delay, d2 | | 2.2 | 0.1 | 3.9 | 0.1 | | 2.2 | 0.6 | | 0.3 | 1.5 | |
| Delay (s) | | 51.8 | 47.1 | 53.9 | 47.4 | | 39.4 | 5.0 | | 5.4 | 15.0 | |
| Level of Service | | D | D | D | D | | D | A | | A | B | |
| Approach Delay (s) | | 50.0 | | | 51.8 | | | 9.8 | | | 14.6 | |
| Approach LOS | | D | | | D | | | A | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 14.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 78.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2035 AM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 5 | 5 | 5 | 345 | 10 | 378 | 5 | 1014 | 277 | 354 | 1384 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.95 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | 1681 | 1690 | 1583 | 1770 | 3425 | | 1770 | 3535 | |
| Flt Permitted | | 0.44 | | 0.75 | 0.73 | 1.00 | 0.17 | 1.00 | | 0.08 | 1.00 | |
| Satd. Flow (perm) | | 791 | | 1323 | 1287 | 1583 | 312 | 3425 | | 141 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 5 | 345 | 10 | 378 | 5 | 1014 | 277 | 354 | 1384 | 10 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 309 | 0 | 19 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 10 | 0 | 179 | 176 | 69 | 5 | 1272 | 0 | 354 | 1394 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | 8 | 8 | 8 | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 4.0 | | 19.8 | 19.8 | 19.8 | 55.1 | 53.9 | | 79.2 | 73.5 | |
| Effective Green, g (s) | | 6.0 | | 21.8 | 21.8 | 21.8 | 59.1 | 56.9 | | 81.2 | 76.5 | |
| Actuated g/C Ratio | | 0.05 | | 0.18 | 0.18 | 0.18 | 0.49 | 0.47 | | 0.68 | 0.64 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 39 | | 240 | 233 | 287 | 192 | 1624 | | 404 | 2253 | |
| v/s Ratio Prot | | | | | | | 0.00 | 0.37 | | c0.17 | 0.39 | |
| v/s Ratio Perm | | c0.01 | | 0.14 | c0.14 | 0.04 | 0.01 | | | c0.43 | | |
| v/c Ratio | | 0.26 | | 0.75 | 0.76 | 0.24 | 0.03 | 0.78 | | 0.88 | 0.62 | |
| Uniform Delay, d1 | | 54.9 | | 46.5 | 46.6 | 42.0 | 15.7 | 26.4 | | 35.5 | 13.0 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.79 | 0.73 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.6 | | 11.9 | 13.0 | 0.4 | 0.1 | 3.6 | | 18.7 | 1.3 | |
| Delay (s) | | 58.5 | | 58.4 | 59.6 | 42.4 | 12.5 | 22.9 | | 54.2 | 14.3 | |
| Level of Service | | E | | E | E | D | B | C | | D | B | |
| Approach Delay (s) | | 58.5 | | 50.4 | | | | 22.9 | | | 22.4 | |
| Approach LOS | | E | | D | | | | C | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 28.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.83 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 83.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2035 AM
8/4/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 30 | 45 | 1357 | 1660 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 33 | 49 | 1475 | 1804 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage veh | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 609 | | |
| pX, platoon unblocked | 0.71 | | | | | |
| vC, conflicting volume | 2651 | 913 | 1826 | | | |
| vC1, stage 1 conf vol | 1815 | | | | | |
| vC2, stage 2 conf vol | 835 | | | | | |
| vCu, unblocked vol | 2505 | 913 | 1826 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 95 | 88 | 85 | | | |
| cM capacity (veh/h) | 110 | 276 | 331 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 5 | 33 | 49 | 738 | 738 | 1203 | 623 |
| Volume Left | 5 | 0 | 49 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 33 | 0 | 0 | 0 | 0 | 22 |
| cSH | 110 | 276 | 331 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.05 | 0.12 | 0.15 | 0.43 | 0.43 | 0.71 | 0.37 |
| Queue Length 95th (ft) | 4 | 10 | 13 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 39.4 | 19.8 | 17.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | E | C | C | | | | |
| Approach Delay (s) | 22.6 | | 0.6 | | | 0.0 | |
| Approach LOS | C | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 0.5 | |
| Intersection Capacity Utilization | 56.5% | | ICU Level of Service B |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2035 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | ↗ | | ↕ | ↗ | ↗ | ↑ | ↗ | ↗ | ↕↔ | |
| Volume (veh/h) | 10 | 5 | 30 | 78 | 5 | 86 | 30 | 1238 | 64 | 41 | 1572 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 14 | 7 | 41 | 107 | 7 | 118 | 41 | 1696 | 88 | 56 | 2153 | 7 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | 1298 | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 4168 | 4047 | 1080 | 3012 | 4051 | 1696 | 2160 | | | 1696 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 4168 | 4047 | 1080 | 3012 | 4051 | 1696 | 2160 | | | 1696 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 0 | 0 | 81 | 0 | 0 | 0 | 83 | | | 85 | | |
| cM capacity (veh/h) | 0 | 2 | 213 | 0 | 2 | 82 | 245 | | | 372 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|------|------|-------|------|------|------|------|------|------|
| Volume Total | 21 | 41 | 114 | 118 | 41 | 1696 | 88 | 56 | 1436 | 725 |
| Volume Left | 14 | 0 | 107 | 0 | 41 | 0 | 0 | 56 | 0 | 0 |
| Volume Right | 0 | 41 | 0 | 118 | 0 | 0 | 88 | 0 | 0 | 7 |
| cSH | 0 | 213 | 0 | 82 | 245 | 1700 | 1700 | 372 | 1700 | 1700 |
| Volume to Capacity | Err | 0.19 | Err | 1.44 | 0.17 | 1.00 | 0.05 | 0.15 | 0.84 | 0.43 |
| Queue Length 95th (ft) | Err | 17 | Err | 232 | 15 | 0 | 0 | 13 | 0 | 0 |
| Control Delay (s) | Err | 25.8 | Err | 345.7 | 22.7 | 0.0 | 0.0 | 16.4 | 0.0 | 0.0 |
| Lane LOS | F | D | F | F | C | | | C | | |
| Approach Delay (s) | Err | | Err | | 0.5 | | | 0.4 | | |
| Approach LOS | F | | F | | | | | | | |

Intersection Summary

| | | | | | | | | | | |
|-----------------------------------|--|--|-------|--|----------------------|--|--|---|--|--|
| Average Delay | | | Err | | | | | | | |
| Intersection Capacity Utilization | | | 83.8% | | ICU Level of Service | | | E | | |
| Analysis Period (min) | | | 15 | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2035 AM
 5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|------|-------|-------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 54 | 412 | 229 | 1031 | 1180 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Lane Util. Factor | 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 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 1792 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.07 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 120 | 1792 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 54 | 412 | 229 | 1031 | 1180 | 35 |
| RTOR Reduction (vph) | 0 | 154 | 0 | 0 | 0 | 9 |
| Lane Group Flow (vph) | 54 | 258 | 229 | 1031 | 1180 | 26 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 21.7 | 21.7 | 70.0 | 70.0 | 55.9 | 55.9 |
| Effective Green, g (s) | 21.7 | 21.7 | 70.0 | 70.0 | 55.9 | 55.9 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.69 | 0.69 | 0.55 | 0.55 |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 363 | 325 | 239 | 1233 | 984 | 837 |
| v/s Ratio Prot | 0.03 | | c0.09 | 0.58 | c0.66 | |
| v/s Ratio Perm | | c0.17 | 0.56 | | | 0.02 |
| v/c Ratio | 0.15 | 0.79 | 0.96 | 0.84 | 1.20 | 0.03 |
| Uniform Delay, d1 | 32.5 | 37.9 | 33.7 | 11.6 | 22.9 | 10.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.2 | 12.5 | 46.0 | 5.1 | 99.6 | 0.0 |
| Delay (s) | 32.7 | 50.4 | 79.7 | 16.7 | 122.5 | 10.5 |
| Level of Service | C | D | E | B | F | B |
| Approach Delay (s) | 48.3 | | | 28.2 | 119.2 | |
| Approach LOS | D | | | C | F | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 69.0 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.07 | | |
| Actuated Cycle Length (s) | 101.7 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 95.9% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2035 AM
 8/4/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|------|-------|------|------|------|-------|
| Lane Configurations | ↶ | ↶ | ↶ | | | ↷ |
| Volume (vph) | 135 | 435 | 678 | 0 | 0 | 1245 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 147 | 473 | 737 | 0 | 0 | 1353 |
| RTOR Reduction (vph) | 0 | 129 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 147 | 344 | 737 | 0 | 0 | 1353 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 28.5 | 28.5 | 64.6 | | | 64.6 |
| Effective Green, g (s) | 28.5 | 28.5 | 64.6 | | | 64.6 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.62 | | | 0.62 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 484 | 433 | 1156 | | | 1156 |
| v/s Ratio Prot | 0.08 | c0.22 | 0.40 | | | c0.73 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.30 | 0.79 | 0.64 | | | 1.17 |
| Uniform Delay, d1 | 29.9 | 35.1 | 12.4 | | | 19.8 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 0.5 | 10.2 | 1.6 | | | 86.2 |
| Delay (s) | 30.4 | 45.3 | 14.0 | | | 106.0 |
| Level of Service | C | D | B | | | F |
| Approach Delay (s) | 41.7 | | 14.0 | | | 106.0 |
| Approach LOS | D | | B | | | F |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 66.3 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.05 | | |
| Actuated Cycle Length (s) | 104.1 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 82.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2035 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕↔ | | ↕ | ↔ | |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 15 | 20 | 1088 | 5 | 5 | 1235 | 20 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 16 | 22 | 1183 | 5 | 5 | 1342 | 22 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2015 | 2596 | 1353 | 2588 | 2604 | 594 | 1364 | | | 1188 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2015 | 2596 | 1353 | 2588 | 2604 | 594 | 1364 | | | 1188 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 83 | 100 | 96 | 53 | 100 | 96 | 96 | | | 99 | | |
| cM capacity (veh/h) | 32 | 23 | 140 | 11 | 23 | 448 | 500 | | | 583 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|-------|------|------|------|------|------|
| Volume Total | 11 | 22 | 22 | 788 | 400 | 5 | 1364 |
| Volume Left | 5 | 5 | 22 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 16 | 0 | 0 | 5 | 0 | 22 |
| cSH | 52 | 43 | 500 | 1700 | 1700 | 583 | 1700 |
| Volume to Capacity | 0.21 | 0.51 | 0.04 | 0.46 | 0.24 | 0.01 | 0.80 |
| Queue Length 95th (ft) | 18 | 46 | 3 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 92.0 | 156.5 | 12.5 | 0.0 | 0.0 | 11.2 | 0.0 |
| Lane LOS | F | F | B | | | B | |
| Approach Delay (s) | 92.0 | 156.5 | 0.2 | | | 0.0 | |
| Approach LOS | F | F | | | | | |

| Intersection Summary | |
|-----------------------------------|-------|
| Average Delay | 1.8 |
| Intersection Capacity Utilization | 76.2% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2035 AM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↔ | ↔ | ↑ | ↔ | ↔ | ↑ | ↔ |
| Volume (veh/h) | 5 | 0 | 5 | 52 | 5 | 23 | 5 | 1082 | 21 | 21 | 1203 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 57 | 5 | 25 | 5 | 1176 | 23 | 23 | 1308 | 5 |
| Pedestrians | | 1 | | | 1 | | | | | | | |
| Lane Width (ft) | | 12.0 | | | 12.0 | | | | | | | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | | | | | | | |
| Percent Blockage | | 0 | | | 0 | | | | | | | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2556 | 2542 | 1309 | 2547 | 2548 | 1177 | 1314 | | | 1177 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2556 | 2542 | 1309 | 2547 | 2548 | 1177 | 1314 | | | 1177 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 57 | 100 | 97 | 0 | 79 | 89 | 99 | | | 96 | | |
| cM capacity (veh/h) | 13 | 26 | 195 | 17 | 25 | 232 | 526 | | | 593 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|-------|------|------|------|------|------|------|------|
| Volume Total | 11 | 87 | 5 | 1176 | 23 | 23 | 1308 | 5 |
| Volume Left | 5 | 57 | 5 | 0 | 0 | 23 | 0 | 0 |
| Volume Right | 5 | 25 | 0 | 0 | 23 | 0 | 0 | 5 |
| cSH | 24 | 24 | 526 | 1700 | 1700 | 593 | 1700 | 1700 |
| Volume to Capacity | 0.45 | 3.66 | 0.01 | 0.69 | 0.01 | 0.04 | 0.77 | 0.00 |
| Queue Length 95th (ft) | 34 | Err | 1 | 0 | 0 | 3 | 0 | 0 |
| Control Delay (s) | 247.0 | Err | 11.9 | 0.0 | 0.0 | 11.3 | 0.0 | 0.0 |
| Lane LOS | F | F | B | | | B | | |
| Approach Delay (s) | 247.0 | Err | 0.1 | | | 0.2 | | |
| Approach LOS | F | F | | | | | | |

Intersection Summary

| | |
|-----------------------------------|-------|
| Average Delay | 330.7 |
| Intersection Capacity Utilization | 75.2% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

2035 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 0 | 5 | 16 | 0 | 71 | 0 | 1353 | 34 | 152 | 1028 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.95 | 1.00 | | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | | | 1770 | 1583 | | 1856 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.62 | 1.00 | | | 0.89 | 1.00 | | 1.00 | | 0.07 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1146 | 1583 | | | 1656 | 1583 | | 1856 | | 136 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 0 | 5 | 16 | 0 | 71 | 0 | 1353 | 34 | 152 | 1028 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Lane Group Flow (vph) | 30 | 1 | 0 | 0 | 16 | 71 | 0 | 1387 | 0 | 152 | 1028 | 12 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 9.1 | 9.1 | | | 2.5 | 82.0 | | 49.9 | | 62.9 | 62.9 | 62.9 |
| Effective Green, g (s) | 11.1 | 11.1 | | | 4.5 | 82.0 | | 51.9 | | 64.9 | 64.9 | 64.9 |
| Actuated g/C Ratio | 0.14 | 0.14 | | | 0.05 | 1.00 | | 0.63 | | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 190 | 214 | | | 90 | 1583 | | 1174 | | 306 | 1474 | 1252 |
| v/s Ratio Prot | c0.01 | 0.00 | | | | | | c0.75 | | 0.06 | c0.55 | |
| v/s Ratio Perm | 0.01 | | | | c0.01 | 0.04 | | | | 0.33 | | 0.01 |
| v/c Ratio | 0.16 | 0.00 | | | 0.18 | 0.04 | | 1.18 | | 0.50 | 0.70 | 0.01 |
| Uniform Delay, d1 | 31.2 | 30.7 | | | 37.0 | 0.0 | | 15.1 | | 20.5 | 4.0 | 1.8 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.4 | 0.0 | | | 0.9 | 0.1 | | 90.5 | | 1.3 | 2.2 | 0.0 |
| Delay (s) | 31.6 | 30.7 | | | 37.9 | 0.1 | | 105.6 | | 21.8 | 6.2 | 1.8 |
| Level of Service | C | C | | | D | A | | F | | C | A | A |
| Approach Delay (s) | | 31.5 | | | 7.0 | | | 105.6 | | | 8.1 | |
| Approach LOS | | C | | | A | | | F | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 58.4 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 0.99 | | |
| Actuated Cycle Length (s) | 82.0 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 100.0% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

2035 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 553 | 10 | 44 | 5 | 5 | 5 | 78 | 1396 | 10 | 10 | 1171 | 1104 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 1.00 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1688 | 1583 | | 1750 | | 1770 | 1861 | | | 1862 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.05 | 1.00 | | | 0.60 | 1.00 |
| Satd. Flow (perm) | 1681 | 1688 | 1583 | | 1750 | | 92 | 1861 | | | 1113 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 553 | 10 | 44 | 5 | 5 | 5 | 78 | 1396 | 10 | 10 | 1171 | 1104 |
| RTOR Reduction (vph) | 0 | 0 | 35 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 227 |
| Lane Group Flow (vph) | 276 | 287 | 9 | 0 | 10 | 0 | 78 | 1406 | 0 | 0 | 1181 | 877 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | Perm |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 | | | 2 5 9 | | 2 9 |
| Actuated Green, G (s) | 29.4 | 29.4 | 29.4 | | 11.7 | | 92.9 | 92.9 | | | 84.8 | 84.8 |
| Effective Green, g (s) | 31.4 | 31.4 | 31.4 | | 13.7 | | 90.4 | 94.9 | | | 87.8 | 87.8 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | | 0.09 | | 0.60 | 0.63 | | | 0.59 | 0.59 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.5 | 3.5 | 3.5 | | 3.0 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 351 | 353 | 331 | | 159 | | 157 | 1177 | | | 651 | 926 |
| v/s Ratio Prot | 0.16 | c0.17 | | | c0.01 | | 0.03 | c0.76 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.27 | | | | c1.06 | 0.55 |
| v/c Ratio | 0.79 | 0.81 | 0.03 | | 0.07 | | 0.50 | 1.19 | | | 1.81 | 0.95 |
| Uniform Delay, d1 | 56.1 | 56.5 | 47.2 | | 62.3 | | 33.2 | 27.5 | | | 31.1 | 28.9 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.15 | 0.99 |
| Incremental Delay, d2 | 11.3 | 13.7 | 0.0 | | 0.2 | | 2.5 | 96.1 | | | 366.9 | 2.5 |
| Delay (s) | 67.5 | 70.2 | 47.2 | | 62.5 | | 35.6 | 123.7 | | | 371.5 | 31.2 |
| Level of Service | E | E | D | | E | | D | F | | | F | C |
| Approach Delay (s) | | 67.3 | | | 62.5 | | | 119.0 | | | 207.1 | |
| Approach LOS | | E | | | E | | | F | | | F | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 157.5 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.42 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 156.2% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
 3: MD 108 & MD32 EB Ramps

2035 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|------|------|------|-------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 176 | 5 | 51 | 0 | 0 | 0 | 0 | 1328 | 626 | 396 | 2234 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 0.95 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.93 | | | | | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1608 | | | | | | 1770 | 1504 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.07 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1608 | | | | | | 1770 | 1504 | 124 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 176 | 5 | 51 | 0 | 0 | 0 | 0 | 1328 | 626 | 396 | 2234 | 0 |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 139 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 121 | 91 | 0 | 0 | 0 | 0 | 0 | 1328 | 487 | 396 | 2234 | 0 |
| Turn Type | Perm | NA | | | | | | NA | Perm | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 | 2 | | |
| Actuated Green, G (s) | 11.7 | 11.7 | | | | | | 94.4 | 94.4 | 87.9 | 76.3 | |
| Effective Green, g (s) | 13.7 | 13.7 | | | | | | 93.9 | 93.9 | 89.9 | 79.3 | |
| Actuated g/C Ratio | 0.09 | 0.09 | | | | | | 0.63 | 0.63 | 0.60 | 0.53 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | | | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | 153 | 146 | | | | | | 1108 | 941 | 402 | 1870 | |
| v/s Ratio Prot | | | | | | | | c0.75 | | c0.20 | c0.63 | |
| v/s Ratio Perm | c0.07 | 0.06 | | | | | | | 0.32 | 0.39 | | |
| v/c Ratio | 0.79 | 0.62 | | | | | | 1.20 | 0.52 | 0.99 | 1.19 | |
| Uniform Delay, d1 | 66.7 | 65.7 | | | | | | 28.0 | 15.5 | 50.1 | 35.4 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.62 | 0.52 | 1.34 | 0.90 | |
| Incremental Delay, d2 | 23.7 | 8.0 | | | | | | 90.2 | 0.1 | 19.0 | 89.3 | |
| Delay (s) | 90.4 | 73.7 | | | | | | 107.7 | 8.2 | 86.0 | 121.1 | |
| Level of Service | F | E | | | | | | F | A | F | F | |
| Approach Delay (s) | | 82.4 | | | 0.0 | | | 75.8 | | | 115.8 | |
| Approach LOS | | F | | | A | | | E | | | F | |

| Intersection Summary | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 98.0 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.17 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 121.5% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

4: MD 108 & MD 32 WB Ramps

2035 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|------|------|------|-------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↗ | ↖ | ↖ | ↕ | | | ↕ | ↗ |
| Volume (vph) | 0 | 0 | 0 | 1107 | 10 | 537 | 55 | 1449 | 0 | 0 | 1523 | 208 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | 2.5 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Fr _t | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.98 | |
| Fl _t Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1687 | 1583 | 1770 | 3539 | | | 3475 | |
| Fl _t Permitted | | | | 0.95 | 0.95 | 1.00 | 0.05 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1687 | 1583 | 99 | 3539 | | | 3475 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 1107 | 10 | 537 | 55 | 1449 | 0 | 0 | 1523 | 208 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 553 | 564 | 537 | 55 | 1449 | 0 | 0 | 1724 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 49.3 | 49.3 | 49.3 | 84.2 | 89.7 | | | 72.5 | |
| Effective Green, g (s) | | | | 52.3 | 52.3 | 52.3 | 90.2 | 92.7 | | | 75.5 | |
| Actuated g/C Ratio | | | | 0.35 | 0.35 | 0.35 | 0.60 | 0.62 | | | 0.50 | |
| Clearance Time (s) | | | | 5.5 | 5.5 | 5.5 | 5.5 | | | | 5.5 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 586 | 588 | 551 | 223 | 2187 | | | 1749 | |
| v/s Ratio Prot | | | | | | | 0.02 | c0.41 | | | c0.50 | |
| v/s Ratio Perm | | | | 0.33 | 0.33 | c0.34 | 0.12 | | | | | |
| v/c Ratio | | | | 0.94 | 0.96 | 0.97 | 0.25 | 0.66 | | | 0.99 | |
| Uniform Delay, d ₁ | | | | 47.4 | 47.8 | 48.2 | 59.2 | 18.5 | | | 36.7 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.45 | 0.29 | | | 0.39 | |
| Incremental Delay, d ₂ | | | | 23.9 | 26.9 | 31.7 | 0.1 | 0.1 | | | 15.1 | |
| Delay (s) | | | | 71.4 | 74.7 | 79.8 | 26.4 | 5.4 | | | 29.6 | |
| Level of Service | | | | E | E | E | C | A | | | C | |
| Approach Delay (s) | | 0.0 | | | 75.2 | | | 6.2 | | | 29.6 | |
| Approach LOS | | A | | | E | | | A | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|-----|
| HCM 2000 Control Delay | 37.8 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.96 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 7.5 |
| Intersection Capacity Utilization | 174.5% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2035 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|-------|------|-------|------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 194 | 20 | 178 | 144 | 15 | 85 | 224 | 1674 | 88 | 32 | 1409 | 102 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1782 | 1583 | 1770 | 1625 | | 1770 | 3513 | | 1770 | 3503 | |
| Flt Permitted | | 0.59 | 1.00 | 0.38 | 1.00 | | 0.09 | 1.00 | | 0.08 | 1.00 | |
| Satd. Flow (perm) | | 1106 | 1583 | 701 | 1625 | | 162 | 3513 | | 152 | 3503 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 194 | 20 | 178 | 144 | 15 | 85 | 224 | 1674 | 88 | 32 | 1409 | 102 |
| RTOR Reduction (vph) | 0 | 0 | 140 | 0 | 67 | 0 | 0 | 2 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 0 | 214 | 38 | 144 | 33 | 0 | 224 | 1760 | 0 | 32 | 1508 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | 8 | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 29.4 | 29.4 | 29.4 | 29.4 | | 109.1 | 100.7 | | 92.7 | 88.8 | |
| Effective Green, g (s) | | 32.4 | 32.4 | 32.4 | 32.4 | | 111.1 | 103.7 | | 96.7 | 91.8 | |
| Actuated g/C Ratio | | 0.22 | 0.22 | 0.22 | 0.22 | | 0.74 | 0.69 | | 0.64 | 0.61 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 238 | 341 | 151 | 351 | | 310 | 2428 | | 161 | 2143 | |
| v/s Ratio Prot | | | | | 0.02 | | c0.09 | c0.50 | | 0.01 | 0.43 | |
| v/s Ratio Perm | | 0.19 | 0.02 | c0.21 | | | 0.45 | | | 0.12 | | |
| v/c Ratio | | 0.90 | 0.11 | 0.95 | 0.10 | | 0.72 | 0.72 | | 0.20 | 0.70 | |
| Uniform Delay, d1 | | 57.2 | 47.2 | 58.1 | 47.1 | | 32.2 | 14.3 | | 14.3 | 19.8 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.38 | 0.74 | | 1.52 | 1.47 | |
| Incremental Delay, d2 | | 32.4 | 0.1 | 59.0 | 0.1 | | 5.6 | 1.3 | | 0.5 | 1.6 | |
| Delay (s) | | 89.6 | 47.4 | 117.0 | 47.2 | | 50.2 | 11.9 | | 22.2 | 30.8 | |
| Level of Service | | F | D | F | D | | D | B | | C | C | |
| Approach Delay (s) | | 70.5 | | | 88.4 | | | 16.3 | | | 30.6 | |
| Approach LOS | | E | | | F | | | B | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 30.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 83.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2035 PM
8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|-------|------|------|-------|------|-------|-------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↖ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 25 | 20 | 10 | 379 | 20 | 526 | 15 | 1614 | 313 | 333 | 1143 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.98 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1777 | | 1681 | 1693 | 1583 | 1770 | 3453 | | 1770 | 3530 | |
| Flt Permitted | | 0.18 | | 0.72 | 0.71 | 1.00 | 0.21 | 1.00 | | 0.06 | 1.00 | |
| Satd. Flow (perm) | | 327 | | 1276 | 1251 | 1583 | 392 | 3453 | | 107 | 3530 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 25 | 20 | 10 | 379 | 20 | 526 | 15 | 1614 | 313 | 333 | 1143 | 20 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 309 | 0 | 11 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 50 | 0 | 189 | 210 | 217 | 15 | 1916 | 0 | 333 | 1163 | 0 |
| Turn Type | Perm | NA | | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | 8 | | 8 | 6 | | | 2 | | |
| Actuated Green, G (s) | | 16.5 | | 24.5 | 24.5 | 24.5 | 67.6 | 65.0 | | 92.0 | 84.9 | |
| Effective Green, g (s) | | 18.5 | | 26.5 | 26.5 | 26.5 | 71.6 | 68.0 | | 94.0 | 87.9 | |
| Actuated g/C Ratio | | 0.12 | | 0.18 | 0.18 | 0.18 | 0.48 | 0.45 | | 0.63 | 0.59 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 40 | | 225 | 221 | 279 | 229 | 1565 | | 338 | 2068 | |
| v/s Ratio Prot | | | | | | | 0.00 | c0.55 | | c0.16 | 0.33 | |
| v/s Ratio Perm | | c0.15 | | 0.15 | c0.17 | 0.14 | 0.03 | | | 0.45 | | |
| v/c Ratio | | 1.24 | | 0.84 | 0.95 | 0.78 | 0.07 | 1.22 | | 0.99 | 0.56 | |
| Uniform Delay, d1 | | 65.8 | | 59.7 | 61.1 | 59.0 | 20.9 | 41.0 | | 52.1 | 19.2 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.91 | 0.79 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 222.7 | | 23.1 | 46.5 | 12.8 | 0.1 | 105.5 | | 44.6 | 1.1 | |
| Delay (s) | | 288.4 | | 82.8 | 107.6 | 71.8 | 19.2 | 137.9 | | 96.7 | 20.3 | |
| Level of Service | | F | | F | F | E | B | F | | F | C | |
| Approach Delay (s) | | 288.4 | | | 82.2 | | | 137.0 | | | 37.3 | |
| Approach LOS | | F | | | F | | | F | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 93.6 | HCM 2000 Level of Service | F |
| HCM 2000 Volume to Capacity ratio | 1.13 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 103.8% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2035 PM
8/4/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 45 | 100 | 105 | 2060 | 1289 | 50 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 109 | 114 | 2239 | 1401 | 54 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | TWLTL | TWLTL | |
| Median storage (veh) | | | | 2 | 2 | |
| Upstream signal (ft) | | | | 620 | | |
| pX, platoon unblocked | 0.55 | | | | | |
| vC, conflicting volume | 2776 | 728 | 1455 | | | |
| vC1, stage 1 conf vol | 1428 | | | | | |
| vC2, stage 2 conf vol | 1348 | | | | | |
| vCu, unblocked vol | 2596 | 728 | 1455 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 70 | 70 | 75 | | | |
| cM capacity (veh/h) | 162 | 366 | 461 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 49 | 109 | 114 | 1120 | 1120 | 934 | 521 |
| Volume Left | 49 | 0 | 114 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 109 | 0 | 0 | 0 | 0 | 54 |
| cSH | 162 | 366 | 461 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.30 | 0.30 | 0.25 | 0.66 | 0.66 | 0.55 | 0.31 |
| Queue Length 95th (ft) | 30 | 31 | 24 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 36.5 | 18.9 | 15.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | E | C | C | | | | |
| Approach Delay (s) | 24.4 | | 0.7 | | | 0.0 | |
| Approach LOS | C | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 1.4 | |
| Intersection Capacity Utilization | 66.9% | | ICU Level of Service C |
| Analysis Period (min) | | 15 | |

HCM Unsignalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2035 PM
 8/4/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | ↗ | | ↕ | ↗ | ↗ | ↑ | ↗ | ↗ | ↕↗ | |
| Volume (veh/h) | 25 | 5 | 80 | 58 | 5 | 128 | 55 | 1879 | 131 | 95 | 1156 | 40 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Hourly flow rate (vph) | 34 | 7 | 110 | 79 | 7 | 175 | 75 | 2574 | 179 | 130 | 1584 | 55 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | 1298 | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 4775 | 4596 | 819 | 3890 | 4623 | 2574 | 1638 | | | 2574 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 4775 | 4596 | 819 | 3890 | 4623 | 2574 | 1638 | | | 2574 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 0 | 0 | 66 | 0 | 0 | 0 | 81 | | | 22 | | |
| cM capacity (veh/h) | 0 | 0 | 318 | 0 | 0 | 20 | 392 | | | 168 | | |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| Volume Total | 41 | 110 | 86 | 175 | 75 | 2574 | 179 | 130 | 1056 | 583 |
| Volume Left | 34 | 0 | 79 | 0 | 75 | 0 | 0 | 130 | 0 | 0 |
| Volume Right | 0 | 110 | 0 | 175 | 0 | 0 | 179 | 0 | 0 | 55 |
| cSH | 0 | 318 | 0 | 20 | 392 | 1700 | 1700 | 168 | 1700 | 1700 |
| Volume to Capacity | Err | 0.34 | Err | 8.83 | 0.19 | 1.51 | 0.11 | 0.78 | 0.62 | 0.34 |
| Queue Length 95th (ft) | Err | 37 | Err | Err | 18 | 0 | 0 | 126 | 0 | 0 |
| Control Delay (s) | Err | 22.1 | Err | Err | 16.4 | 0.0 | 0.0 | 76.3 | 0.0 | 0.0 |
| Lane LOS | F | C | F | F | C | | | F | | |
| Approach Delay (s) | Err | | Err | | 0.4 | | | 5.6 | | |
| Approach LOS | F | | F | | | | | | | |

Intersection Summary

| | | | | | | | | | | |
|-----------------------------------|--|--------|--|----------------------|--|--|--|---|--|--|
| Average Delay | | Err | | | | | | | | |
| Intersection Capacity Utilization | | 120.2% | | ICU Level of Service | | | | H | | |
| Analysis Period (min) | | 15 | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2035 PM
 5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|-------|------|-------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 39 | 207 | 542 | 1441 | 1047 | 65 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Lane Util. Factor | 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 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 1792 | 1792 | 1524 |
| Flt Permitted | 0.95 | 1.00 | 0.06 | 1.00 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1703 | 1524 | 113 | 1792 | 1792 | 1524 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 39 | 207 | 542 | 1441 | 1047 | 65 |
| RTOR Reduction (vph) | 0 | 190 | 0 | 0 | 0 | 21 |
| Lane Group Flow (vph) | 39 | 17 | 542 | 1441 | 1047 | 44 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Actuated Green, G (s) | 9.5 | 9.5 | 94.5 | 94.5 | 59.5 | 59.5 |
| Effective Green, g (s) | 9.5 | 9.5 | 94.5 | 94.5 | 59.5 | 59.5 |
| Actuated g/C Ratio | 0.08 | 0.08 | 0.83 | 0.83 | 0.52 | 0.52 |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | 5.5 |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Lane Grp Cap (vph) | 141 | 127 | 526 | 1485 | 935 | 795 |
| v/s Ratio Prot | c0.02 | | c0.28 | 0.80 | c0.58 | |
| v/s Ratio Perm | | 0.01 | 0.57 | | | 0.03 |
| v/c Ratio | 0.28 | 0.14 | 1.03 | 0.97 | 1.12 | 0.06 |
| Uniform Delay, d1 | 49.0 | 48.4 | 37.1 | 8.5 | 27.2 | 13.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 1.1 | 0.5 | 47.3 | 16.7 | 68.1 | 0.0 |
| Delay (s) | 50.1 | 48.9 | 84.3 | 25.3 | 95.4 | 13.4 |
| Level of Service | D | D | F | C | F | B |
| Approach Delay (s) | 49.1 | | | 41.4 | 90.6 | |
| Approach LOS | D | | | D | F | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 58.4 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.01 | | |
| Actuated Cycle Length (s) | 114.0 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 103.5% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2035 PM
 8/4/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|-------|------|-------|------|------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 10 | 25 | 1450 | 0 | 0 | 1128 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 27 | 1576 | 0 | 0 | 1226 |
| RTOR Reduction (vph) | 0 | 18 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 9 | 1576 | 0 | 0 | 1226 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 4.9 | 4.9 | 73.7 | | | 73.7 |
| Effective Green, g (s) | 4.9 | 4.9 | 73.7 | | | 73.7 |
| Actuated g/C Ratio | 0.05 | 0.05 | 0.82 | | | 0.82 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 96 | 86 | 1532 | | | 1532 |
| v/s Ratio Prot | c0.01 | 0.01 | c0.85 | | | 0.66 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.11 | 0.11 | 1.03 | | | 0.80 |
| Uniform Delay, d1 | 40.3 | 40.3 | 7.9 | | | 4.1 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 0.7 | 0.7 | 30.7 | | | 3.5 |
| Delay (s) | 41.0 | 41.0 | 38.6 | | | 7.7 |
| Level of Service | D | D | D | | | A |
| Approach Delay (s) | 41.0 | | 38.6 | | | 7.7 |
| Approach LOS | D | | D | | | A |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 25.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.97 | | |
| Actuated Cycle Length (s) | 89.6 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 92.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2035 PM
 8/4/2014
























| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↗ | ↕↗ | | ↗ | ↗ | |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 1455 | 15 | 5 | 1118 | 25 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 1582 | 16 | 5 | 1215 | 27 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2047 | 2848 | 1229 | 2832 | 2854 | 799 | 1242 | | | 1598 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2047 | 2848 | 1229 | 2832 | 2854 | 799 | 1242 | | | 1598 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 83 | 100 | 97 | 29 | 100 | 98 | 99 | | | 99 | | |
| cM capacity (veh/h) | 31 | 16 | 170 | 8 | 16 | 328 | 556 | | | 406 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|-------|------|------|------|------|------|
| Volume Total | 11 | 11 | 5 | 1054 | 543 | 5 | 1242 |
| Volume Left | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 5 | 0 | 0 | 16 | 0 | 27 |
| cSH | 53 | 15 | 556 | 1700 | 1700 | 406 | 1700 |
| Volume to Capacity | 0.20 | 0.73 | 0.01 | 0.62 | 0.32 | 0.01 | 0.73 |
| Queue Length 95th (ft) | 17 | 45 | 1 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 89.6 | 473.6 | 11.5 | 0.0 | 0.0 | 14.0 | 0.0 |
| Lane LOS | F | F | B | | | B | |
| Approach Delay (s) | 89.6 | 473.6 | 0.0 | | | 0.1 | |
| Approach LOS | F | F | | | | | |

| Intersection Summary | |
|-----------------------------------|------------------------------|
| Average Delay | 2.2 |
| Intersection Capacity Utilization | 70.4% ICU Level of Service C |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2035 PM
 8/4/2014

| |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | |  |  |  |  |  |  |  |  |
| Volume (veh/h) | 5 | 5 | 0 | 49 | 5 | 47 | 5 | 1408 | 52 | 23 | 1099 | 10 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 53 | 5 | 51 | 5 | 1530 | 57 | 25 | 1195 | 11 |
| Pedestrians | | | | | 1 | | | | | | | 1 |
| Lane Width (ft) | | | | | 12.0 | | | | | | | 12.0 |
| Walking Speed (ft/s) | | | | | 4.0 | | | | | | | 4.0 |
| Percent Blockage | | | | | 0 | | | | | | | 0 |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | | None |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2815 | 2787 | 1195 | 2790 | 2798 | 1532 | 1205 | | | 1531 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2815 | 2787 | 1195 | 2790 | 2798 | 1532 | 1205 | | | 1531 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 0 | 69 | 100 | 0 | 68 | 64 | 99 | | | 94 | | |
| cM capacity (veh/h) | 5 | 17 | 227 | 9 | 17 | 143 | 579 | | | 434 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 | | | | |
| Volume Total | 11 | 110 | 5 | 1530 | 57 | 25 | 1195 | 11 | | | | |
| Volume Left | 5 | 53 | 5 | 0 | 0 | 25 | 0 | 0 | | | | |
| Volume Right | 0 | 51 | 0 | 0 | 57 | 0 | 0 | 11 | | | | |
| cSH | 8 | 16 | 579 | 1700 | 1700 | 434 | 1700 | 1700 | | | | |
| Volume to Capacity | 1.34 | 6.79 | 0.01 | 0.90 | 0.03 | 0.06 | 0.70 | 0.01 | | | | |
| Queue Length 95th (ft) | 55 | Err | 1 | 0 | 0 | 5 | 0 | 0 | | | | |
| Control Delay (s) | 1043.6 | Err | 11.3 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 | | | | |
| Lane LOS | F | F | B | | | B | | | | | | |
| Approach Delay (s) | 1043.6 | Err | 0.0 | | | 0.3 | | | | | | |
| Approach LOS | F | F | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 376.9 | | | | | | | | | |
| Intersection Capacity Utilization | | | 91.1% | ICU Level of Service | | F | | | | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

2035 AM Ultimate Footprint
 7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|-------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 5 | 5 | 10 | 49 | 10 | 138 | 5 | 919 | 33 | 97 | 991 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.90 | | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1676 | | | 1788 | 1583 | 1770 | 3521 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.59 | 1.00 | | | 0.76 | 1.00 | 0.21 | 1.00 | | 0.22 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1106 | 1676 | | | 1413 | 1583 | 400 | 3521 | | 404 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 10 | 49 | 10 | 138 | 5 | 919 | 33 | 97 | 991 | 20 |
| RTOR Reduction (vph) | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 |
| Lane Group Flow (vph) | 5 | 7 | 0 | 0 | 59 | 138 | 5 | 951 | 0 | 97 | 991 | 14 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 12.3 | 12.3 | | | 7.5 | 70.1 | 37.5 | 37.5 | | 47.8 | 47.8 | 47.8 |
| Effective Green, g (s) | 14.3 | 14.3 | | | 9.5 | 70.1 | 39.5 | 39.5 | | 49.8 | 49.8 | 49.8 |
| Actuated g/C Ratio | 0.20 | 0.20 | | | 0.14 | 1.00 | 0.56 | 0.56 | | 0.71 | 0.71 | 0.71 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | 6.0 | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 252 | 341 | | | 191 | 1583 | 225 | 1984 | | 429 | 1323 | 1124 |
| v/s Ratio Prot | 0.00 | 0.00 | | | | | | 0.27 | | 0.02 | c0.53 | |
| v/s Ratio Perm | 0.00 | | | | c0.04 | c0.09 | 0.01 | | | 0.14 | | 0.01 |
| v/c Ratio | 0.02 | 0.02 | | | 0.31 | 0.09 | 0.02 | 0.48 | | 0.23 | 0.75 | 0.01 |
| Uniform Delay, d1 | 22.3 | 22.3 | | | 27.3 | 0.0 | 6.8 | 9.1 | | 4.3 | 6.3 | 3.0 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.0 | 0.0 | | | 0.9 | 0.1 | 0.1 | 0.5 | | 0.3 | 3.2 | 0.0 |
| Delay (s) | 22.3 | 22.3 | | | 28.3 | 0.1 | 6.9 | 9.7 | | 4.6 | 9.5 | 3.0 |
| Level of Service | C | C | | | C | A | A | A | | A | A | A |
| Approach Delay (s) | | 22.3 | | | 8.5 | | | 9.7 | | | 8.9 | |
| Approach LOS | | C | | | A | | | A | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 9.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 70.1 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 88.7% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

2035 AM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|-------|--------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 937 | 10 | 79 | 5 | 5 | 5 | 43 | 1058 | 10 | 5 | 1068 | 508 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 0.95 | | | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1687 | 1583 | | 1750 | | 1770 | 3534 | | | 3538 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.15 | 1.00 | | | 0.95 | 1.00 |
| Satd. Flow (perm) | 1681 | 1687 | 1583 | | 1750 | | 274 | 3534 | | | 3362 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 937 | 10 | 79 | 5 | 5 | 5 | 43 | 1058 | 10 | 5 | 1068 | 508 |
| RTOR Reduction (vph) | 0 | 0 | 57 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 207 |
| Lane Group Flow (vph) | 468 | 479 | 22 | 0 | 10 | 0 | 43 | 1068 | 0 | 0 | 1073 | 301 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | custom |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 9 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 9 | | | 2 5 9 | | 2 5 9 |
| Actuated Green, G (s) | 32.0 | 32.0 | 32.0 | | 7.5 | | 67.5 | 67.5 | | | 58.0 | 68.0 |
| Effective Green, g (s) | 34.0 | 34.0 | 34.0 | | 9.5 | | 65.5 | 70.0 | | | 61.0 | 71.0 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | | 0.08 | | 0.55 | 0.58 | | | 0.51 | 0.59 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 476 | 477 | 448 | | 138 | | 243 | 2061 | | | 1709 | 936 |
| v/s Ratio Prot | 0.28 | c0.28 | | | c0.01 | | 0.01 | c0.30 | | | | |
| v/s Ratio Perm | | | 0.01 | | | | 0.09 | | | | c0.32 | 0.19 |
| v/c Ratio | 0.98 | 1.00 | 0.05 | | 0.08 | | 0.18 | 0.52 | | | 0.63 | 0.32 |
| Uniform Delay, d1 | 42.7 | 43.0 | 31.3 | | 51.2 | | 15.8 | 14.9 | | | 21.3 | 12.4 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.02 | 0.00 |
| Incremental Delay, d2 | 36.6 | 42.2 | 0.0 | | 0.2 | | 0.4 | 0.2 | | | 0.2 | 0.0 |
| Delay (s) | 79.4 | 85.2 | 31.3 | | 51.4 | | 16.1 | 15.1 | | | 0.6 | 0.0 |
| Level of Service | E | F | C | | D | | B | B | | | A | A |
| Approach Delay (s) | | 78.4 | | | 51.4 | | | 15.1 | | | 0.4 | |
| Approach LOS | | E | | | D | | | B | | | A | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 26.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 75.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |





















HCM Signalized Intersection Capacity Analysis
 3: MD 108 & MD32 EB Ramps

2035 AM Ultimate Footprint
 7/22/2014

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | | |
|-----------------------------------|---------------------|-------|--------|------|------|------|------|------|--------|-------|-------|---------------------------|----------------------|---|
| Lane Configurations | | | | | | | | | | | | | | |
| Volume (vph) | 227 | 5 | 54 | 0 | 0 | 0 | 0 | 970 | 1030 | 459 | 1527 | 0 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | | | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 1.00 | 1.00 | 0.95 | | | |
| Frt | 1.00 | 0.94 | | | | | | 1.00 | 0.85 | 1.00 | 1.00 | | | |
| Flt Protected | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | | | |
| Satd. Flow (prot) | 1681 | 1617 | | | | | | 3539 | 1583 | 1770 | 3539 | | | |
| Flt Permitted | 0.95 | 0.97 | | | | | | 1.00 | 1.00 | 0.12 | 1.00 | | | |
| Satd. Flow (perm) | 1681 | 1617 | | | | | | 3539 | 1583 | 219 | 3539 | | | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | |
| Adj. Flow (vph) | 227 | 5 | 54 | 0 | 0 | 0 | 0 | 970 | 1030 | 459 | 1527 | 0 | | |
| RTOR Reduction (vph) | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 0 | 0 | 0 | | |
| Lane Group Flow (vph) | 152 | 114 | 0 | 0 | 0 | 0 | 0 | 970 | 900 | 459 | 1527 | 0 | | |
| Turn Type | Perm | NA | | | | | | NA | custom | pm+pt | NA | | | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | | | |
| Permitted Phases | 4 | | | | | | | | 3 6 9 | 2 | | | | |
| Actuated Green, G (s) | 7.5 | 7.5 | | | | | | 72.0 | 71.5 | 58.5 | 48.5 | | | |
| Effective Green, g (s) | 9.5 | 9.5 | | | | | | 71.5 | 75.0 | 60.5 | 51.5 | | | |
| Actuated g/C Ratio | 0.08 | 0.08 | | | | | | 0.60 | 0.62 | 0.50 | 0.43 | | | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | | | |
| Vehicle Extension (s) | 2.5 | 2.5 | | | | | | | | 2.5 | 5.0 | | | |
| Lane Grp Cap (vph) | 133 | 128 | | | | | | 2108 | 989 | 452 | 1518 | | | |
| v/s Ratio Prot | | | | | | | | 0.27 | | c0.22 | c0.43 | | | |
| v/s Ratio Perm | c0.09 | 0.07 | | | | | | | c0.57 | 0.29 | | | | |
| v/c Ratio | 1.14 | 0.89 | | | | | | 0.46 | 0.91 | 1.02 | 1.01 | | | |
| Uniform Delay, d1 | 55.2 | 54.7 | | | | | | 13.5 | 19.6 | 35.9 | 34.2 | | | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.81 | 0.98 | 0.87 | 0.97 | | | |
| Incremental Delay, d2 | 121.5 | 46.7 | | | | | | 0.1 | 8.2 | 31.5 | 19.8 | | | |
| Delay (s) | 176.8 | 101.4 | | | | | | 11.0 | 27.4 | 62.6 | 53.0 | | | |
| Level of Service | F | F | | | | | | B | C | E | D | | | |
| Approach Delay (s) | | 141.5 | | | 0.0 | | | 19.4 | | | 55.2 | | | |
| Approach LOS | | F | | | A | | | B | | | E | | | |
| Intersection Summary | | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 44.2 | | | | | | | | | HCM 2000 Level of Service | D | |
| HCM 2000 Volume to Capacity ratio | | | 1.05 | | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 120.0 | | | | | | | | 15.5 | | Sum of lost time (s) | |
| Intersection Capacity Utilization | | | 107.7% | | | | | | | | | | ICU Level of Service | G |
| Analysis Period (min) | | | 15 | | | | | | | | | | | |
| c | Critical Lane Group | | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
4: MD 108 & MD 32 WB Ramps

2035 AM Ultimate Footprint
7/22/2014

| |  |  |  |  |  |  |  |  |  |  |  |  | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR | |
| Lane Configurations | | | |  |  |  |  |  |  | |  |  | |
| Volume (vph) | 0 | 0 | 0 | 495 | 0 | 399 | 68 | 1129 | 0 | 0 | 1491 | 154 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Total Lost time (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | 3.0 | | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | | |
| Fr _t | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.99 | | |
| Fl _t Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | | |
| Satd. Flow (prot) | | | | 1681 | 1681 | 1583 | 1770 | 3539 | | | 3490 | | |
| Fl _t Permitted | | | | 0.95 | 0.95 | 1.00 | 0.06 | 1.00 | | | 1.00 | | |
| Satd. Flow (perm) | | | | 1681 | 1681 | 1583 | 118 | 3539 | | | 3490 | | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Adj. Flow (vph) | 0 | 0 | 0 | 495 | 0 | 399 | 68 | 1129 | 0 | 0 | 1491 | 154 | |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 247 | 248 | 399 | 68 | 1129 | 0 | 0 | 1639 | 0 | |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | | |
| Actuated Green, G (s) | | | | 32.8 | 32.8 | 32.8 | 69.2 | 75.2 | | | 60.1 | | |
| Effective Green, g (s) | | | | 35.8 | 35.8 | 35.8 | 75.2 | 78.2 | | | 63.1 | | |
| Actuated g/C Ratio | | | | 0.30 | 0.30 | 0.30 | 0.63 | 0.65 | | | 0.53 | | |
| Clearance Time (s) | | | | 6.0 | 6.0 | 6.0 | 6.0 | | | | 6.0 | | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | | |
| Lane Grp Cap (vph) | | | | 501 | 501 | 472 | 240 | 2306 | | | 1835 | | |
| v/s Ratio Prot | | | | | | | 0.03 | c0.32 | | | c0.47 | | |
| v/s Ratio Perm | | | | 0.15 | 0.15 | c0.25 | 0.15 | | | | | | |
| v/c Ratio | | | | 0.49 | 0.50 | 0.85 | 0.28 | 0.49 | | | 0.89 | | |
| Uniform Delay, d ₁ | | | | 34.6 | 34.7 | 39.5 | 42.4 | 10.7 | | | 25.4 | | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 1.59 | 1.19 | | | 0.78 | | |
| Incremental Delay, d ₂ | | | | 0.8 | 0.8 | 13.1 | 0.6 | 0.1 | | | 5.5 | | |
| Delay (s) | | | | 35.4 | 35.4 | 52.6 | 67.9 | 12.9 | | | 25.4 | | |
| Level of Service | | | | D | D | D | E | B | | | C | | |
| Approach Delay (s) | | 0.0 | | | 43.1 | | | 16.0 | | | 25.4 | | |
| Approach LOS | | A | | | D | | | B | | | C | | |
| Intersection Summary | | | | | | | | | | | | | |
| HCM 2000 Control Delay | | | 26.6 | HCM 2000 Level of Service | | | | | | | C | | |
| HCM 2000 Volume to Capacity ratio | | | 0.84 | | | | | | | | | | |
| Actuated Cycle Length (s) | | | 120.0 | Sum of lost time (s) | | | | | | 9.0 | | | |
| Intersection Capacity Utilization | | | 107.7% | ICU Level of Service | | | | | | G | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | | |
| c | Critical Lane Group | | | | | | | | | | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2035 AM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|------|------|-------|-------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 67 | 5 | 44 | 73 | 10 | 26 | 212 | 1203 | 113 | 81 | 1528 | 126 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.89 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1780 | 1583 | 1770 | 1661 | | 1770 | 3494 | | 1770 | 3499 | |
| Flt Permitted | | 0.71 | 1.00 | 0.64 | 1.00 | | 0.08 | 1.00 | | 0.19 | 1.00 | |
| Satd. Flow (perm) | | 1331 | 1583 | 1188 | 1661 | | 153 | 3494 | | 359 | 3499 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 67 | 5 | 44 | 73 | 10 | 26 | 212 | 1203 | 113 | 81 | 1528 | 126 |
| RTOR Reduction (vph) | 0 | 0 | 39 | 0 | 23 | 0 | 0 | 3 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 72 | 5 | 73 | 13 | 0 | 212 | 1313 | 0 | 81 | 1650 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 10.9 | 10.9 | 10.9 | 10.9 | | 97.6 | 87.6 | | 83.4 | 77.9 | |
| Effective Green, g (s) | | 13.9 | 13.9 | 13.9 | 13.9 | | 99.6 | 90.6 | | 87.4 | 80.9 | |
| Actuated g/C Ratio | | 0.12 | 0.12 | 0.12 | 0.12 | | 0.83 | 0.75 | | 0.73 | 0.67 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 154 | 183 | 137 | 192 | | 358 | 2637 | | 349 | 2358 | |
| v/s Ratio Prot | | | | | 0.01 | | c0.08 | 0.38 | | 0.01 | c0.47 | |
| v/s Ratio Perm | | 0.05 | 0.00 | c0.06 | | | 0.40 | | | 0.15 | | |
| v/c Ratio | | 0.47 | 0.03 | 0.53 | 0.07 | | 0.59 | 0.50 | | 0.23 | 0.70 | |
| Uniform Delay, d1 | | 49.6 | 47.1 | 50.0 | 47.3 | | 23.6 | 5.8 | | 4.8 | 12.1 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.85 | 0.70 | | 1.41 | 1.23 | |
| Incremental Delay, d2 | | 2.2 | 0.1 | 3.9 | 0.1 | | 2.2 | 0.6 | | 0.3 | 1.5 | |
| Delay (s) | | 51.8 | 47.1 | 53.9 | 47.4 | | 45.8 | 4.6 | | 7.1 | 16.4 | |
| Level of Service | | D | D | D | D | | D | A | | A | B | |
| Approach Delay (s) | | 50.0 | | | 51.8 | | | 10.3 | | | 15.9 | |
| Approach LOS | | D | | | D | | | B | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 15.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 78.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2035 AM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|------|------|-------|------|------|-------|------|------|
| Lane Configurations | | ↔ | | ↔ | ↔ | ↔ | ↔ | ↕ | | ↔ | ↕ | |
| Volume (vph) | 5 | 5 | 5 | 345 | 10 | 378 | 5 | 1014 | 277 | 354 | 1384 | 10 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.95 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.97 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | 1681 | 1690 | 1583 | 1770 | 3425 | | 1770 | 3535 | |
| Flt Permitted | | 0.98 | | 0.95 | 0.95 | 1.00 | 0.18 | 1.00 | | 0.09 | 1.00 | |
| Satd. Flow (perm) | | 1750 | | 1681 | 1690 | 1583 | 334 | 3425 | | 171 | 3535 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 5 | 5 | 5 | 345 | 10 | 378 | 5 | 1014 | 277 | 354 | 1384 | 10 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 0 | 319 | 0 | 17 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 10 | 0 | 179 | 176 | 59 | 5 | 1274 | 0 | 354 | 1394 | 0 |
| Turn Type | Split | NA | | Split | NA | Prot | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | 8 | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | | | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 3.2 | | 16.7 | 16.7 | 16.7 | 58.7 | 57.6 | | 83.1 | 77.5 | |
| Effective Green, g (s) | | 5.2 | | 18.7 | 18.7 | 18.7 | 62.7 | 60.6 | | 85.1 | 80.5 | |
| Actuated g/C Ratio | | 0.04 | | 0.16 | 0.16 | 0.16 | 0.52 | 0.51 | | 0.71 | 0.67 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 75 | | 261 | 263 | 246 | 211 | 1729 | | 427 | 2371 | |
| v/s Ratio Prot | | c0.01 | | c0.11 | 0.10 | 0.04 | 0.00 | 0.37 | | c0.16 | 0.39 | |
| v/s Ratio Perm | | | | | | | 0.01 | | | c0.43 | | |
| v/c Ratio | | 0.14 | | 0.69 | 0.67 | 0.24 | 0.02 | 0.74 | | 0.83 | 0.59 | |
| Uniform Delay, d1 | | 55.2 | | 47.9 | 47.7 | 44.4 | 13.8 | 23.4 | | 31.9 | 10.7 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.68 | 0.54 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.8 | | 7.3 | 6.3 | 0.5 | 0.0 | 2.6 | | 12.5 | 1.1 | |
| Delay (s) | | 56.1 | | 55.1 | 54.1 | 44.9 | 9.4 | 15.2 | | 44.4 | 11.8 | |
| Level of Service | | E | | E | D | D | A | B | | D | B | |
| Approach Delay (s) | | 56.1 | | | 49.6 | | | 15.1 | | | 18.4 | |
| Approach LOS | | E | | | D | | | B | | | B | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 23.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 120.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 83.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2035 AM Ultimate Footprint
7/22/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 5 | 30 | 45 | 1357 | 1660 | 20 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 33 | 49 | 1475 | 1804 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | TWLTL | |
| Median storage (veh) | | | | | 2 | |
| Upstream signal (ft) | | | | 609 | 723 | |
| pX, platoon unblocked | 0.66 | 0.52 | 0.52 | | | |
| vC, conflicting volume | 2651 | 913 | 1826 | | | |
| vC1, stage 1 conf vol | 1815 | | | | | |
| vC2, stage 2 conf vol | 835 | | | | | |
| vCu, unblocked vol | 590 | 0 | 748 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 94 | 89 | | | |
| cM capacity (veh/h) | 224 | 565 | 446 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 5 | 33 | 49 | 738 | 738 | 1203 | 623 |
| Volume Left | 5 | 0 | 49 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 33 | 0 | 0 | 0 | 0 | 22 |
| cSH | 224 | 565 | 446 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.02 | 0.06 | 0.11 | 0.43 | 0.43 | 0.71 | 0.37 |
| Queue Length 95th (ft) | 2 | 5 | 9 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 21.5 | 11.8 | 14.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | C | B | B | | | | |
| Approach Delay (s) | 13.1 | | 0.5 | | | 0.0 | |
| Approach LOS | B | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 0.4 | |
| Intersection Capacity Utilization | 56.5% | | ICU Level of Service B |
| Analysis Period (min) | 15 | | |

HCM Signalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2035 AM Ultimate Footprint
 7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|-------|------|-------|------|------|-------|-------|------|
| Lane Configurations | | ↕ | ↗ | | ↕ | ↗ | ↗ | ↕↗ | | ↗ | ↕↗ | |
| Volume (vph) | 10 | 5 | 30 | 78 | 5 | 86 | 30 | 1238 | 64 | 41 | 1572 | 5 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 1.00 | |
| Flt Protected | | 0.97 | 1.00 | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1735 | 1524 | | 1712 | 1524 | 1703 | 3380 | | 1703 | 3404 | |
| Flt Permitted | | 0.80 | 1.00 | | 0.72 | 1.00 | 0.05 | 1.00 | | 0.08 | 1.00 | |
| Satd. Flow (perm) | | 1441 | 1524 | | 1297 | 1524 | 85 | 3380 | | 146 | 3404 | |
| Peak-hour factor, PHF | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Adj. Flow (vph) | 14 | 7 | 41 | 107 | 7 | 118 | 41 | 1696 | 88 | 56 | 2153 | 7 |
| RTOR Reduction (vph) | 0 | 0 | 36 | 0 | 0 | 104 | 0 | 3 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 21 | 5 | 0 | 114 | 14 | 41 | 1781 | 0 | 56 | 2160 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | | 14.1 | 14.1 | | 14.1 | 14.1 | 89.2 | 84.1 | | 89.4 | 84.2 | |
| Effective Green, g (s) | | 14.1 | 14.1 | | 14.1 | 14.1 | 89.2 | 84.1 | | 89.4 | 84.2 | |
| Actuated g/C Ratio | | 0.12 | 0.12 | | 0.12 | 0.12 | 0.75 | 0.71 | | 0.76 | 0.71 | |
| Clearance Time (s) | | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 6.0 | | 4.5 | 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) | | 171 | 181 | | 154 | 181 | 133 | 2400 | | 178 | 2420 | |
| v/s Ratio Prot | | | | | | | 0.01 | 0.53 | | c0.01 | c0.63 | |
| v/s Ratio Perm | | 0.01 | 0.00 | | c0.09 | 0.01 | 0.22 | | | 0.22 | | |
| v/c Ratio | | 0.12 | 0.03 | | 0.74 | 0.08 | 0.31 | 0.74 | | 0.31 | 0.89 | |
| Uniform Delay, d1 | | 46.6 | 46.1 | | 50.4 | 46.4 | 17.9 | 10.5 | | 9.2 | 13.5 | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.3 | 0.1 | | 17.3 | 0.2 | 1.3 | 2.1 | | 1.0 | 5.5 | |
| Delay (s) | | 46.9 | 46.1 | | 67.7 | 46.6 | 19.2 | 12.6 | | 10.2 | 19.1 | |
| Level of Service | | D | D | | E | D | B | B | | B | B | |
| Approach Delay (s) | | 46.4 | | | 56.9 | | | 12.8 | | | 18.8 | |
| Approach LOS | | D | | | E | | | B | | | B | |

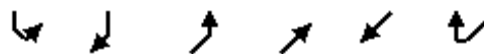
Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 18.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.84 | | |
| Actuated Cycle Length (s) | 118.4 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 64.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2035 AM Ultimate Footprint
 5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|------|-------|-------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 54 | 412 | 229 | 1031 | 1180 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1524 | 1703 | 3406 | 3391 | |
| Flt Permitted | 0.95 | 1.00 | 0.10 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1703 | 1524 | 183 | 3406 | 3391 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 54 | 412 | 229 | 1031 | 1180 | 35 |
| RTOR Reduction (vph) | 0 | 148 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 54 | 264 | 229 | 1031 | 1213 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | |
| Actuated Green, G (s) | 20.1 | 20.1 | 52.1 | 52.1 | 37.5 | |
| Effective Green, g (s) | 20.1 | 20.1 | 52.1 | 52.1 | 37.5 | |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.63 | 0.63 | 0.46 | |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 416 | 372 | 311 | 2158 | 1546 | |
| v/s Ratio Prot | 0.03 | | c0.09 | 0.30 | c0.36 | |
| v/s Ratio Perm | | c0.17 | 0.37 | | | |
| v/c Ratio | 0.13 | 0.71 | 0.74 | 0.48 | 0.78 | |
| Uniform Delay, d1 | 24.2 | 28.4 | 16.7 | 7.9 | 18.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 6.1 | 8.8 | 0.2 | 2.7 | |
| Delay (s) | 24.4 | 34.5 | 25.4 | 8.1 | 21.6 | |
| Level of Service | C | C | C | A | C | |
| Approach Delay (s) | 33.3 | | | 11.2 | 21.6 | |
| Approach LOS | C | | | B | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 19.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 82.2 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 67.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2035 AM Ultimate Footprint
 7/22/2014



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|------------------------|------|-------|------|------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 135 | 435 | 678 | 0 | 0 | 1245 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 147 | 473 | 737 | 0 | 0 | 1353 |
| RTOR Reduction (vph) | 0 | 263 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 147 | 210 | 737 | 0 | 0 | 1353 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 17.1 | 17.1 | 86.3 | | | 86.3 |
| Effective Green, g (s) | 17.1 | 17.1 | 86.3 | | | 86.3 |
| Actuated g/C Ratio | 0.15 | 0.15 | 0.75 | | | 0.75 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 264 | 236 | 1405 | | | 1405 |
| v/s Ratio Prot | 0.08 | c0.13 | 0.40 | | | c0.73 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.56 | 0.89 | 0.52 | | | 0.96 |
| Uniform Delay, d1 | 45.1 | 47.7 | 5.7 | | | 12.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 3.1 | 31.9 | 0.7 | | | 16.2 |
| Delay (s) | 48.3 | 79.6 | 6.4 | | | 28.8 |
| Level of Service | D | E | A | | | C |
| Approach Delay (s) | 72.2 | | 6.4 | | | 28.8 |
| Approach LOS | E | | A | | | C |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 32.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.95 | | |
| Actuated Cycle Length (s) | 114.4 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 82.2% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2035 AM Ultimate Footprint
 7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↕ | | | ↕ | | ↕ | ↕↕ | | ↕ | ↕ | |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 15 | 20 | 1088 | 5 | 5 | 1235 | 20 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 16 | 22 | 1183 | 5 | 5 | 1342 | 22 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2015 | 2596 | 1353 | 2588 | 2604 | 594 | 1364 | | | 1188 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2015 | 2596 | 1353 | 2588 | 2604 | 594 | 1364 | | | 1188 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 83 | 100 | 96 | 53 | 100 | 96 | 96 | | | 99 | | |
| cM capacity (veh/h) | 32 | 23 | 140 | 11 | 23 | 448 | 500 | | | 583 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|-------|------|------|------|------|------|
| Volume Total | 11 | 22 | 22 | 788 | 400 | 5 | 1364 |
| Volume Left | 5 | 5 | 22 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 16 | 0 | 0 | 5 | 0 | 22 |
| cSH | 52 | 43 | 500 | 1700 | 1700 | 583 | 1700 |
| Volume to Capacity | 0.21 | 0.51 | 0.04 | 0.46 | 0.24 | 0.01 | 0.80 |
| Queue Length 95th (ft) | 18 | 46 | 3 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 92.0 | 156.5 | 12.5 | 0.0 | 0.0 | 11.2 | 0.0 |
| Lane LOS | F | F | B | | | B | |
| Approach Delay (s) | 92.0 | 156.5 | 0.2 | | | 0.0 | |
| Approach LOS | F | F | | | | | |

| Intersection Summary | |
|-----------------------------------|-------|
| Average Delay | 1.8 |
| Intersection Capacity Utilization | 76.2% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2035 AM Ultimate Footprint
 7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | ↔ | ↔ | ↑ | ↔ | ↔ | ↑ | ↔ |
| Volume (veh/h) | 5 | 0 | 5 | 52 | 5 | 23 | 5 | 1082 | 21 | 21 | 1203 | 5 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 57 | 5 | 25 | 5 | 1176 | 23 | 23 | 1308 | 5 |
| Pedestrians | | 1 | | | 1 | | | | | | | |
| Lane Width (ft) | | 12.0 | | | 12.0 | | | | | | | |
| Walking Speed (ft/s) | | 4.0 | | | 4.0 | | | | | | | |
| Percent Blockage | | 0 | | | 0 | | | | | | | |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2556 | 2542 | 1309 | 2547 | 2548 | 1177 | 1314 | | | 1177 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2556 | 2542 | 1309 | 2547 | 2548 | 1177 | 1314 | | | 1177 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 57 | 100 | 97 | 0 | 79 | 89 | 99 | | | 96 | | |
| cM capacity (veh/h) | 13 | 26 | 195 | 17 | 25 | 232 | 526 | | | 593 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 |
|------------------------|-------|------|------|------|------|------|------|------|
| Volume Total | 11 | 87 | 5 | 1176 | 23 | 23 | 1308 | 5 |
| Volume Left | 5 | 57 | 5 | 0 | 0 | 23 | 0 | 0 |
| Volume Right | 5 | 25 | 0 | 0 | 23 | 0 | 0 | 5 |
| cSH | 24 | 24 | 526 | 1700 | 1700 | 593 | 1700 | 1700 |
| Volume to Capacity | 0.45 | 3.66 | 0.01 | 0.69 | 0.01 | 0.04 | 0.77 | 0.00 |
| Queue Length 95th (ft) | 34 | Err | 1 | 0 | 0 | 3 | 0 | 0 |
| Control Delay (s) | 247.0 | Err | 11.9 | 0.0 | 0.0 | 11.3 | 0.0 | 0.0 |
| Lane LOS | F | F | B | | | B | | |
| Approach Delay (s) | 247.0 | Err | 0.1 | | | 0.2 | | |
| Approach LOS | F | F | | | | | | |

| Intersection Summary | | |
|-----------------------------------|-------|----------------------|
| Average Delay | | 330.7 |
| Intersection Capacity Utilization | 75.2% | ICU Level of Service |
| Analysis Period (min) | | 15 |
| | | D |

HCM Signalized Intersection Capacity Analysis
 1: MD 108 & Church Ent./Guildford Rd.

2035 PM Ultimate Footprint
 7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|------|------|------|-------|------|------|------|------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 30 | 0 | 5 | 16 | 0 | 71 | 0 | 1353 | 34 | 152 | 1028 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.0 | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | 3.0 | 3.0 |
| Lane Util. Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 0.95 | | 1.00 | 1.00 | 1.00 |
| Frt | 1.00 | 0.85 | | | 1.00 | 0.85 | | 1.00 | | 1.00 | 1.00 | 0.85 |
| Flt Protected | 0.95 | 1.00 | | | 0.95 | 1.00 | | 1.00 | | 0.95 | 1.00 | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | | | 1770 | 1583 | | 3526 | | 1770 | 1863 | 1583 |
| Flt Permitted | 0.62 | 1.00 | | | 0.89 | 1.00 | | 1.00 | | 0.12 | 1.00 | 1.00 |
| Satd. Flow (perm) | 1146 | 1583 | | | 1656 | 1583 | | 3526 | | 227 | 1863 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 30 | 0 | 5 | 16 | 0 | 71 | 0 | 1353 | 34 | 152 | 1028 | 15 |
| RTOR Reduction (vph) | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 |
| Lane Group Flow (vph) | 30 | 1 | 0 | 0 | 16 | 71 | 0 | 1386 | 0 | 152 | 1028 | 12 |
| Turn Type | pm+pt | NA | | Perm | NA | Free | Perm | NA | | pm+pt | NA | Perm |
| Protected Phases | 7 | 4 | | | 8 | | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | Free | 2 | | | 6 | | 6 |
| Actuated Green, G (s) | 9.1 | 9.1 | | | 2.5 | 82.0 | | 49.9 | | 62.9 | 62.9 | 62.9 |
| Effective Green, g (s) | 11.1 | 11.1 | | | 4.5 | 82.0 | | 51.9 | | 64.9 | 64.9 | 64.9 |
| Actuated g/C Ratio | 0.14 | 0.14 | | | 0.05 | 1.00 | | 0.63 | | 0.79 | 0.79 | 0.79 |
| Clearance Time (s) | 4.0 | 5.0 | | | 5.0 | | | 5.0 | | 5.0 | 5.0 | 5.0 |
| Vehicle Extension (s) | 3.0 | 3.0 | | | 3.0 | | | 6.0 | | 3.0 | 6.0 | 6.0 |
| Lane Grp Cap (vph) | 190 | 214 | | | 90 | 1583 | | 2231 | | 367 | 1474 | 1252 |
| v/s Ratio Prot | c0.01 | 0.00 | | | | | | 0.39 | | 0.05 | c0.55 | |
| v/s Ratio Perm | 0.01 | | | | c0.01 | 0.04 | | | | 0.28 | | 0.01 |
| v/c Ratio | 0.16 | 0.00 | | | 0.18 | 0.04 | | 0.62 | | 0.41 | 0.70 | 0.01 |
| Uniform Delay, d1 | 31.2 | 30.7 | | | 37.0 | 0.0 | | 9.1 | | 6.4 | 4.0 | 1.8 |
| Progression Factor | 1.00 | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 |
| Incremental Delay, d2 | 0.4 | 0.0 | | | 0.9 | 0.1 | | 0.9 | | 0.8 | 2.2 | 0.0 |
| Delay (s) | 31.6 | 30.7 | | | 37.9 | 0.1 | | 10.0 | | 7.1 | 6.2 | 1.8 |
| Level of Service | C | C | | | D | A | | B | | A | A | A |
| Approach Delay (s) | | 31.5 | | | 7.0 | | | 10.0 | | | 6.2 | |
| Approach LOS | | C | | | A | | | B | | | A | |

| Intersection Summary | | |
|-----------------------------------|-------|---------------------------|
| HCM 2000 Control Delay | 8.5 | HCM 2000 Level of Service |
| HCM 2000 Volume to Capacity ratio | 0.66 | A |
| Actuated Cycle Length (s) | 82.0 | Sum of lost time (s) |
| Intersection Capacity Utilization | 89.1% | 11.0 |
| Analysis Period (min) | 15 | ICU Level of Service |
| c Critical Lane Group | | E |

HCM Signalized Intersection Capacity Analysis
2: MD 108 & Ten Oaks. Rd./Gas Sta.

2035 PM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|-------|------|-------|-------|------|--------|------|--------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 553 | 10 | 44 | 5 | 5 | 5 | 78 | 1396 | 10 | 10 | 1171 | 1104 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 3.0 | 3.0 | 3.0 | | 2.5 | | 2.5 | 4.5 | | | 3.5 | 3.5 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | | 1.00 | | 1.00 | 0.95 | | | 0.95 | 1.00 |
| Frt | 1.00 | 1.00 | 0.85 | | 0.95 | | 1.00 | 1.00 | | | 1.00 | 0.85 |
| Flt Protected | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.95 | 1.00 | | | 1.00 | 1.00 |
| Satd. Flow (prot) | 1681 | 1688 | 1583 | | 1750 | | 1770 | 3535 | | | 3538 | 1583 |
| Flt Permitted | 0.95 | 0.95 | 1.00 | | 0.98 | | 0.17 | 1.00 | | | 0.94 | 1.00 |
| Satd. Flow (perm) | 1681 | 1688 | 1583 | | 1750 | | 325 | 3535 | | | 3310 | 1583 |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 553 | 10 | 44 | 5 | 5 | 5 | 78 | 1396 | 10 | 10 | 1171 | 1104 |
| RTOR Reduction (vph) | 0 | 0 | 36 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 291 |
| Lane Group Flow (vph) | 276 | 287 | 8 | 0 | 10 | 0 | 78 | 1406 | 0 | 0 | 1181 | 813 |
| Turn Type | Split | NA | Perm | Split | NA | | pm+pt | NA | | custom | NA | custom |
| Protected Phases | 3 | 3 | | 4 | 4 | | 1 | 5 6 9 | | | 2 9 | |
| Permitted Phases | | | 3 | | | | 5 6 9 | | | 2 5 9 | | 2 5 9 |
| Actuated Green, G (s) | 24.0 | 24.0 | 24.0 | | 7.5 | | 105.5 | 105.5 | | | 96.0 | 106.0 |
| Effective Green, g (s) | 26.0 | 26.0 | 26.0 | | 9.5 | | 103.5 | 108.0 | | | 99.0 | 109.0 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | | 0.06 | | 0.69 | 0.72 | | | 0.66 | 0.73 |
| Clearance Time (s) | 5.0 | 5.0 | 5.0 | | 4.5 | | 4.5 | | | | | |
| Vehicle Extension (s) | 3.5 | 3.5 | 3.5 | | 3.0 | | 3.0 | | | | | |
| Lane Grp Cap (vph) | 291 | 292 | 274 | | 110 | | 296 | 2545 | | | 2184 | 1150 |
| v/s Ratio Prot | 0.16 | c0.17 | | | c0.01 | | 0.01 | 0.40 | | | | |
| v/s Ratio Perm | | | 0.00 | | | | 0.17 | | | | 0.36 | c0.51 |
| v/c Ratio | 0.95 | 0.98 | 0.03 | | 0.09 | | 0.26 | 0.55 | | | 0.54 | 0.71 |
| Uniform Delay, d1 | 61.3 | 61.8 | 51.5 | | 66.2 | | 10.3 | 9.8 | | | 13.5 | 11.5 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | 1.00 | | 1.00 | 1.00 | | | 0.02 | 10.62 |
| Incremental Delay, d2 | 38.9 | 47.8 | 0.0 | | 0.4 | | 0.5 | 0.3 | | | 0.0 | 0.2 |
| Delay (s) | 100.3 | 109.5 | 51.6 | | 66.6 | | 10.7 | 10.0 | | | 0.3 | 122.5 |
| Level of Service | F | F | D | | E | | B | B | | | A | F |
| Approach Delay (s) | | 101.1 | | | 66.6 | | | 10.1 | | | 59.3 | |
| Approach LOS | | F | | | E | | | B | | | E | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 48.5 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.75 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 14.5 |
| Intersection Capacity Utilization | 121.0% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis

3: MD 108 & MD32 EB Ramps

2035 PM Ultimate Footprint

7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|------|------|------|------|-------|-------|-------|-------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 176 | 5 | 51 | 0 | 0 | 0 | 0 | 1328 | 626 | 396 | 2234 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 2.5 | 2.5 | | | | | | 2.0 | 2.0 | 4.5 | 3.5 | |
| Lane Util. Factor | 0.95 | 0.95 | | | | | | 0.95 | 1.00 | 1.00 | 0.95 | |
| Frt | 1.00 | 0.93 | | | | | | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1681 | 1608 | | | | | | 3539 | 1583 | 1770 | 3539 | |
| Flt Permitted | 0.95 | 0.98 | | | | | | 1.00 | 1.00 | 0.11 | 1.00 | |
| Satd. Flow (perm) | 1681 | 1608 | | | | | | 3539 | 1583 | 199 | 3539 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 176 | 5 | 51 | 0 | 0 | 0 | 0 | 1328 | 626 | 396 | 2234 | 0 |
| RTOR Reduction (vph) | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 115 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 121 | 90 | 0 | 0 | 0 | 0 | 0 | 1328 | 511 | 396 | 2234 | 0 |
| Turn Type | Perm | NA | | | | | | NA | Perm | pm+pt | NA | |
| Protected Phases | | 4 | | | | | | 3 6 | | 5 | 2 | |
| Permitted Phases | 4 | | | | | | | | 3 6 | 2 | | |
| Actuated Green, G (s) | 7.5 | 7.5 | | | | | | 100.7 | 100.7 | 96.5 | 86.5 | |
| Effective Green, g (s) | 9.5 | 9.5 | | | | | | 100.2 | 100.2 | 98.5 | 89.5 | |
| Actuated g/C Ratio | 0.06 | 0.06 | | | | | | 0.67 | 0.67 | 0.66 | 0.60 | |
| Clearance Time (s) | 4.5 | 4.5 | | | | | | | | 6.5 | 6.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | | | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | 106 | 101 | | | | | | 2364 | 1057 | 421 | 2111 | |
| v/s Ratio Prot | | | | | | | | c0.38 | | c0.17 | c0.63 | |
| v/s Ratio Perm | c0.07 | 0.06 | | | | | | | 0.32 | 0.44 | | |
| v/c Ratio | 1.14 | 0.89 | | | | | | 0.56 | 0.48 | 0.94 | 1.06 | |
| Uniform Delay, d1 | 70.2 | 69.8 | | | | | | 13.2 | 12.2 | 40.5 | 30.2 | |
| Progression Factor | 1.00 | 1.00 | | | | | | 0.97 | 1.36 | 1.69 | 0.85 | |
| Incremental Delay, d2 | 130.5 | 56.8 | | | | | | 0.2 | 0.3 | 11.0 | 30.1 | |
| Delay (s) | 200.8 | 126.6 | | | | | | 13.0 | 17.0 | 79.5 | 55.8 | |
| Level of Service | F | F | | | | | | B | B | E | E | |
| Approach Delay (s) | | 165.3 | | | 0.0 | | | 14.3 | | | 59.3 | |
| Approach LOS | | F | | | A | | | B | | | E | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 46.2 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.97 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 15.5 |
| Intersection Capacity Utilization | 77.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
4: MD 108 & MD 32 WB Ramps

2035 PM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|------|------|------|------|------|-------|--------|-------|------|------|-------|------|
| Lane Configurations | | | | ↖ | ↗ | ↖ | ↖ | ↕ | | | ↕ | ↗ |
| Volume (vph) | 0 | 0 | 0 | 1107 | 10 | 537 | 55 | 1449 | 0 | 0 | 1523 | 208 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 | | | 2.5 | |
| Lane Util. Factor | | | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | | 0.95 | |
| Fr _t | | | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | | | 0.98 | |
| Fl _t Protected | | | | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | | | 1.00 | |
| Satd. Flow (prot) | | | | 1681 | 1687 | 1583 | 1770 | 3539 | | | 3475 | |
| Fl _t Permitted | | | | 0.95 | 0.95 | 1.00 | 0.05 | 1.00 | | | 1.00 | |
| Satd. Flow (perm) | | | | 1681 | 1687 | 1583 | 99 | 3539 | | | 3475 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 0 | 0 | 0 | 1107 | 10 | 537 | 55 | 1449 | 0 | 0 | 1523 | 208 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 553 | 564 | 537 | 55 | 1449 | 0 | 0 | 1724 | 0 |
| Turn Type | | | | Perm | NA | Perm | custom | NA | | | NA | |
| Protected Phases | | | | | 4 | | 1 | 1 6 | | | 2 | |
| Permitted Phases | | | | 4 | | 4 | 6 | | | | | |
| Actuated Green, G (s) | | | | 49.3 | 49.3 | 49.3 | 84.2 | 89.7 | | | 72.5 | |
| Effective Green, g (s) | | | | 52.3 | 52.3 | 52.3 | 90.2 | 92.7 | | | 75.5 | |
| Actuated g/C Ratio | | | | 0.35 | 0.35 | 0.35 | 0.60 | 0.62 | | | 0.50 | |
| Clearance Time (s) | | | | 5.5 | 5.5 | 5.5 | 5.5 | | | | 5.5 | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | 3.0 | | | | 5.0 | |
| Lane Grp Cap (vph) | | | | 586 | 588 | 551 | 223 | 2187 | | | 1749 | |
| v/s Ratio Prot | | | | | | | 0.02 | c0.41 | | | c0.50 | |
| v/s Ratio Perm | | | | 0.33 | 0.33 | c0.34 | 0.12 | | | | | |
| v/c Ratio | | | | 0.94 | 0.96 | 0.97 | 0.25 | 0.66 | | | 0.99 | |
| Uniform Delay, d ₁ | | | | 47.4 | 47.8 | 48.2 | 59.2 | 18.5 | | | 36.7 | |
| Progression Factor | | | | 1.00 | 1.00 | 1.00 | 0.59 | 0.81 | | | 0.56 | |
| Incremental Delay, d ₂ | | | | 23.9 | 26.9 | 31.7 | 0.5 | 0.6 | | | 15.1 | |
| Delay (s) | | | | 71.4 | 74.7 | 79.8 | 35.5 | 15.6 | | | 35.6 | |
| Level of Service | | | | E | E | E | D | B | | | D | |
| Approach Delay (s) | | 0.0 | | | 75.2 | | | 16.3 | | | 35.6 | |
| Approach LOS | | A | | | E | | | B | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|-----|
| HCM 2000 Control Delay | 43.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 0.96 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 7.5 |
| Intersection Capacity Utilization | 130.7% | ICU Level of Service | H |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
5: MD 108 & Auto Dr./Firehouse

2035 PM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|-------|------|------|-------|-------|------|-------|------|------|
| Lane Configurations | | ↖ | ↗ | ↖ | ↗ | | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 194 | 20 | 178 | 144 | 15 | 85 | 224 | 1674 | 88 | 32 | 1409 | 102 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 2.5 | 2.5 | | 2.5 | 2.5 | |
| Lane Util. Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | 1.00 | 0.87 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1782 | 1583 | 1770 | 1625 | | 1770 | 3513 | | 1770 | 3503 | |
| Flt Permitted | | 0.60 | 1.00 | 0.40 | 1.00 | | 0.07 | 1.00 | | 0.08 | 1.00 | |
| Satd. Flow (perm) | | 1124 | 1583 | 749 | 1625 | | 139 | 3513 | | 146 | 3503 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 194 | 20 | 178 | 144 | 15 | 85 | 224 | 1674 | 88 | 32 | 1409 | 102 |
| RTOR Reduction (vph) | 0 | 0 | 136 | 0 | 65 | 0 | 0 | 2 | 0 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 0 | 214 | 42 | 144 | 35 | 0 | 224 | 1760 | 0 | 32 | 1508 | 0 |
| Turn Type | Perm | NA | Perm | Perm | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 1 | 6 | | 5 | 2 | |
| Permitted Phases | 4 | | 4 | 8 | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 32.1 | 32.1 | 32.1 | 32.1 | | 106.4 | 98.2 | | 87.6 | 83.9 | |
| Effective Green, g (s) | | 35.1 | 35.1 | 35.1 | 35.1 | | 108.4 | 101.2 | | 91.6 | 86.9 | |
| Actuated g/C Ratio | | 0.23 | 0.23 | 0.23 | 0.23 | | 0.72 | 0.67 | | 0.61 | 0.58 | |
| Clearance Time (s) | | 6.0 | 6.0 | 6.0 | 6.0 | | 4.5 | 5.5 | | 4.5 | 5.5 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 263 | 370 | 175 | 380 | | 317 | 2370 | | 150 | 2029 | |
| v/s Ratio Prot | | | | | 0.02 | | c0.09 | c0.50 | | 0.01 | 0.43 | |
| v/s Ratio Perm | | 0.19 | 0.03 | c0.19 | | | 0.42 | | | 0.12 | | |
| v/c Ratio | | 0.81 | 0.11 | 0.82 | 0.09 | | 0.71 | 0.74 | | 0.21 | 0.74 | |
| Uniform Delay, d1 | | 54.4 | 45.2 | 54.5 | 45.0 | | 36.8 | 15.9 | | 16.3 | 23.3 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.35 | 0.89 | | 1.07 | 1.03 | |
| Incremental Delay, d2 | | 17.3 | 0.1 | 25.7 | 0.1 | | 4.9 | 1.5 | | 0.6 | 2.3 | |
| Delay (s) | | 71.6 | 45.3 | 80.2 | 45.1 | | 54.7 | 15.7 | | 18.1 | 26.2 | |
| Level of Service | | E | D | F | D | | D | B | | B | C | |
| Approach Delay (s) | | 59.7 | | | 65.8 | | | 20.1 | | | 26.0 | |
| Approach LOS | | E | | | E | | | C | | | C | |

Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|-----|
| HCM 2000 Control Delay | 28.7 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 83.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Signalized Intersection Capacity Analysis
6: MD 108 & Hardware Store/Great Star Drive

2035 PM Ultimate Footprint
7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|------|-------|------|-------|-------|-------|------|-------|------|------|
| Lane Configurations | | ↕ | | ↖ | ↗ | ↖ | ↖ | ↕ | | ↖ | ↕ | |
| Volume (vph) | 25 | 20 | 10 | 379 | 20 | 526 | 15 | 1614 | 313 | 333 | 1143 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 3.5 | | 3.5 | 3.5 | 3.5 | 2.5 | 3.0 | | 2.5 | 3.0 | |
| Lane Util. Factor | | 1.00 | | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.98 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1777 | | 1681 | 1693 | 1583 | 1770 | 3453 | | 1770 | 3530 | |
| Flt Permitted | | 0.98 | | 0.95 | 0.96 | 1.00 | 0.22 | 1.00 | | 0.05 | 1.00 | |
| Satd. Flow (perm) | | 1777 | | 1681 | 1693 | 1583 | 401 | 3453 | | 99 | 3530 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 25 | 20 | 10 | 379 | 20 | 526 | 15 | 1614 | 313 | 333 | 1143 | 20 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 0 | 198 | 0 | 11 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 49 | 0 | 189 | 210 | 328 | 15 | 1916 | 0 | 333 | 1162 | 0 |
| Turn Type | Split | NA | | Split | NA | Prot | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | 8 | 1 | 6 | | 5 | 2 | |
| Permitted Phases | | | | | | | 6 | | | 2 | | |
| Actuated Green, G (s) | | 6.7 | | 30.4 | 30.4 | 30.4 | 73.1 | 70.9 | | 95.9 | 89.2 | |
| Effective Green, g (s) | | 8.7 | | 32.4 | 32.4 | 32.4 | 77.1 | 73.9 | | 97.9 | 92.2 | |
| Actuated g/C Ratio | | 0.06 | | 0.22 | 0.22 | 0.22 | 0.51 | 0.49 | | 0.65 | 0.61 | |
| Clearance Time (s) | | 5.5 | | 5.5 | 5.5 | 5.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Vehicle Extension (s) | | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 5.0 | | 3.0 | 5.0 | |
| Lane Grp Cap (vph) | | 103 | | 363 | 365 | 341 | 244 | 1701 | | 315 | 2169 | |
| v/s Ratio Prot | | c0.03 | | 0.11 | 0.12 | c0.21 | 0.00 | c0.55 | | c0.16 | 0.33 | |
| v/s Ratio Perm | | | | | | | 0.03 | | | 0.53 | | |
| v/c Ratio | | 0.48 | | 0.52 | 0.58 | 0.96 | 0.06 | 1.13 | | 1.06 | 0.54 | |
| Uniform Delay, d1 | | 68.5 | | 51.9 | 52.6 | 58.2 | 18.1 | 38.0 | | 53.4 | 16.6 | |
| Progression Factor | | 1.00 | | 1.00 | 1.00 | 1.00 | 0.78 | 0.64 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.5 | | 1.3 | 2.2 | 38.7 | 0.1 | 63.5 | | 66.6 | 1.0 | |
| Delay (s) | | 71.9 | | 53.3 | 54.8 | 96.9 | 14.2 | 87.8 | | 120.0 | 17.6 | |
| Level of Service | | E | | D | D | F | B | F | | F | B | |
| Approach Delay (s) | | 71.9 | | | 78.5 | | | 87.3 | | | 40.4 | |
| Approach LOS | | E | | | E | | | F | | | D | |

Intersection Summary

| | | | |
|-----------------------------------|--------|---------------------------|------|
| HCM 2000 Control Delay | 69.3 | HCM 2000 Level of Service | E |
| HCM 2000 Volume to Capacity ratio | 1.03 | | |
| Actuated Cycle Length (s) | 150.0 | Sum of lost time (s) | 12.5 |
| Intersection Capacity Utilization | 103.8% | ICU Level of Service | G |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
7: MD 108 & Clarksville Square

2035 PM Ultimate Footprint
7/22/2014



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|------------------------|------|------|------|------|-------|------|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 45 | 100 | 105 | 2060 | 1289 | 50 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 49 | 109 | 114 | 2239 | 1401 | 54 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | TWLTL | |
| Median storage (veh) | | | | | 2 | |
| Upstream signal (ft) | | | | 620 | 713 | |
| pX, platoon unblocked | 0.62 | 0.80 | 0.80 | | | |
| vC, conflicting volume | 2776 | 728 | 1455 | | | |
| vC1, stage 1 conf vol | 1428 | | | | | |
| vC2, stage 2 conf vol | 1348 | | | | | |
| vCu, unblocked vol | 1183 | 159 | 1069 | | | |
| tC, single (s) | 6.8 | 6.9 | 4.1 | | | |
| tC, 2 stage (s) | 5.8 | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 77 | 84 | 78 | | | |
| cM capacity (veh/h) | 217 | 686 | 518 | | | |

| Direction, Lane # | EB 1 | EB 2 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|------|------|------|------|------|------|
| Volume Total | 49 | 109 | 114 | 1120 | 1120 | 934 | 521 |
| Volume Left | 49 | 0 | 114 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 109 | 0 | 0 | 0 | 0 | 54 |
| cSH | 217 | 686 | 518 | 1700 | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.23 | 0.16 | 0.22 | 0.66 | 0.66 | 0.55 | 0.31 |
| Queue Length 95th (ft) | 21 | 14 | 21 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 26.4 | 11.2 | 13.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lane LOS | D | B | B | | | | |
| Approach Delay (s) | 15.9 | | 0.7 | | | 0.0 | |
| Approach LOS | C | | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|-----|------------------------|
| Average Delay | | 1.0 | |
| Intersection Capacity Utilization | 66.9% | | ICU Level of Service C |
| Analysis Period (min) | 15 | | |

HCM Signalized Intersection Capacity Analysis
 8: MD 108 & Freestate Gas Station/Linden Linthicum Lane

2035 PM Ultimate Footprint

7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|-------|-------|-------|------|-------|-------|------|
| Lane Configurations | | ↕ | ↗ | | ↕ | ↗ | ↗ | ↕↗ | | ↗ | ↕↗ | |
| Volume (vph) | 25 | 5 | 80 | 58 | 5 | 128 | 55 | 1879 | 131 | 95 | 1156 | 40 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 6.0 | | 4.5 | 6.0 | |
| Lane Util. Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 1.00 | 0.85 | | 1.00 | 0.85 | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.96 | 1.00 | | 0.96 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1721 | 1524 | | 1714 | 1524 | 1703 | 3372 | | 1703 | 3389 | |
| Flt Permitted | | 0.62 | 1.00 | | 0.71 | 1.00 | 0.12 | 1.00 | | 0.04 | 1.00 | |
| Satd. Flow (perm) | | 1103 | 1524 | | 1279 | 1524 | 207 | 3372 | | 64 | 3389 | |
| Peak-hour factor, PHF | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 | 0.73 |
| Adj. Flow (vph) | 34 | 7 | 110 | 79 | 7 | 175 | 75 | 2574 | 179 | 130 | 1584 | 55 |
| RTOR Reduction (vph) | 0 | 0 | 100 | 0 | 0 | 71 | 0 | 3 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 41 | 10 | 0 | 86 | 104 | 75 | 2750 | 0 | 130 | 1638 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | | 6 | | |
| Actuated Green, G (s) | | 13.9 | 13.9 | | 13.9 | 13.9 | 117.7 | 111.1 | | 119.5 | 112.0 | |
| Effective Green, g (s) | | 13.9 | 13.9 | | 13.9 | 13.9 | 117.7 | 111.1 | | 119.5 | 112.0 | |
| Actuated g/C Ratio | | 0.09 | 0.09 | | 0.09 | 0.09 | 0.80 | 0.75 | | 0.81 | 0.76 | |
| Clearance Time (s) | | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 6.0 | | 4.5 | 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) | | 103 | 143 | | 120 | 143 | 232 | 2539 | | 135 | 2573 | |
| v/s Ratio Prot | | | | | | | 0.01 | c0.82 | | c0.05 | 0.48 | |
| v/s Ratio Perm | | 0.04 | 0.01 | | 0.07 | c0.07 | 0.24 | | | 0.73 | | |
| v/c Ratio | | 0.40 | 0.07 | | 0.72 | 0.73 | 0.32 | 1.08 | | 0.96 | 0.64 | |
| Uniform Delay, d1 | | 62.9 | 60.9 | | 64.9 | 65.0 | 6.3 | 18.2 | | 57.2 | 8.3 | |
| Progression Factor | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.5 | 0.2 | | 18.4 | 16.9 | 0.8 | 45.0 | | 65.7 | 0.5 | |
| Delay (s) | | 65.4 | 61.1 | | 83.3 | 81.9 | 7.1 | 63.2 | | 122.9 | 8.8 | |
| Level of Service | | E | E | | F | F | A | E | | F | A | |
| Approach Delay (s) | | 62.3 | | | 82.4 | | | 61.7 | | | 17.2 | |
| Approach LOS | | E | | | F | | | E | | | B | |

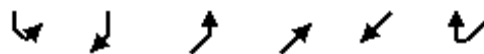
Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 47.1 | HCM 2000 Level of Service | D |
| HCM 2000 Volume to Capacity ratio | 1.04 | | |
| Actuated Cycle Length (s) | 147.5 | Sum of lost time (s) | 15.0 |
| Intersection Capacity Utilization | 84.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 9: MD 108 & Sheppard Lane

2035 PM Ultimate Footprint
 5/5/2015



| Movement | SBL | SBR | NEL | NET | SWT | SWR |
|------------------------|-------|------|-------|------|------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 39 | 207 | 542 | 1441 | 1047 | 65 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | |
| 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) | 1703 | 1524 | 1703 | 3406 | 3376 | |
| Flt Permitted | 0.95 | 1.00 | 0.10 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1703 | 1524 | 182 | 3406 | 3376 | |
| Peak-hour factor, PHF | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj. Flow (vph) | 39 | 207 | 542 | 1441 | 1047 | 65 |
| RTOR Reduction (vph) | 0 | 186 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 39 | 21 | 542 | 1441 | 1108 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 6% | 6% | 6% |
| Turn Type | Prot | Perm | pm+pt | NA | NA | |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | |
| Actuated Green, G (s) | 9.2 | 9.2 | 70.0 | 70.0 | 36.0 | |
| Effective Green, g (s) | 9.2 | 9.2 | 70.0 | 70.0 | 36.0 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.78 | 0.78 | 0.40 | |
| Clearance Time (s) | 4.5 | 4.5 | 4.0 | 5.5 | 5.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 175 | 157 | 654 | 2672 | 1362 | |
| v/s Ratio Prot | c0.02 | | c0.28 | 0.42 | 0.33 | |
| v/s Ratio Perm | | 0.01 | c0.37 | | | |
| v/c Ratio | 0.22 | 0.14 | 0.83 | 0.54 | 0.81 | |
| Uniform Delay, d1 | 36.7 | 36.4 | 21.0 | 3.6 | 23.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.4 | 8.5 | 0.2 | 3.8 | |
| Delay (s) | 37.4 | 36.8 | 29.6 | 3.8 | 27.5 | |
| Level of Service | D | D | C | A | C | |
| Approach Delay (s) | 36.9 | | | 10.8 | 27.5 | |
| Approach LOS | D | | | B | C | |











Intersection Summary

| | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 18.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 89.2 | Sum of lost time (s) | 14.0 |
| Intersection Capacity Utilization | 79.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 10: MD 108 & High School Egress

2035 PM Ultimate Footprint
 7/22/2014

| |  |  |  |  |  |  |
|------------------------|---|---|---|---|---|---|
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
| Lane Configurations |  |  |  | | |  |
| Volume (vph) | 10 | 25 | 1450 | 0 | 0 | 1128 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Frt | 1.00 | 0.85 | 1.00 | | | 1.00 |
| Flt Protected | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | | | 1863 |
| Flt Permitted | 0.95 | 1.00 | 1.00 | | | 1.00 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | | | 1863 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 27 | 1576 | 0 | 0 | 1226 |
| RTOR Reduction (vph) | 0 | 26 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 11 | 1 | 1576 | 0 | 0 | 1226 |
| Turn Type | Prot | Prot | NA | | | NA |
| Protected Phases | 4 | 4 | 6 | | | 2 |
| Permitted Phases | | | | | | |
| Actuated Green, G (s) | 4.9 | 4.9 | 126.3 | | | 126.3 |
| Effective Green, g (s) | 4.9 | 4.9 | 126.3 | | | 126.3 |
| Actuated g/C Ratio | 0.03 | 0.03 | 0.89 | | | 0.89 |
| Clearance Time (s) | 5.0 | 5.0 | 6.0 | | | 6.0 |
| Vehicle Extension (s) | 4.0 | 4.0 | 5.0 | | | 5.0 |
| Lane Grp Cap (vph) | 60 | 54 | 1654 | | | 1654 |
| v/s Ratio Prot | c0.01 | 0.00 | c0.85 | | | 0.66 |
| v/s Ratio Perm | | | | | | |
| v/c Ratio | 0.18 | 0.02 | 0.95 | | | 0.74 |
| Uniform Delay, d1 | 66.7 | 66.3 | 5.8 | | | 2.6 |
| Progression Factor | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Incremental Delay, d2 | 2.0 | 0.2 | 13.0 | | | 2.2 |
| Delay (s) | 68.7 | 66.5 | 18.8 | | | 4.8 |
| Level of Service | E | E | B | | | A |
| Approach Delay (s) | 67.1 | | 18.8 | | | 4.8 |
| Approach LOS | E | | B | | | A |

| Intersection Summary | | | |
|-----------------------------------|-------|---------------------------|------|
| HCM 2000 Control Delay | 13.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.92 | | |
| Actuated Cycle Length (s) | 142.2 | Sum of lost time (s) | 11.0 |
| Intersection Capacity Utilization | 92.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

HCM Unsignalized Intersection Capacity Analysis
 11: MD 108 & Broad Meadow Lane/High School Parking Lot

2035 PM Ultimate Footprint
 7/22/2014



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | | ↔ | | | ↔ | | ↗ | ↕ | | ↖ | ↕ | |
| Volume (veh/h) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 1455 | 15 | 5 | 1118 | 25 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 1582 | 16 | 5 | 1215 | 27 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage (veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | 479 | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2047 | 2848 | 1229 | 2832 | 2854 | 799 | 1242 | | | 1598 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2047 | 2848 | 1229 | 2832 | 2854 | 799 | 1242 | | | 1598 | | |
| tC, single (s) | 7.5 | 6.5 | 6.9 | 7.5 | 6.5 | 6.9 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 83 | 100 | 97 | 29 | 100 | 98 | 99 | | | 99 | | |
| cM capacity (veh/h) | 31 | 16 | 170 | 8 | 16 | 328 | 556 | | | 406 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 |
|------------------------|------|-------|------|------|------|------|------|
| Volume Total | 11 | 11 | 5 | 1054 | 543 | 5 | 1242 |
| Volume Left | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Volume Right | 5 | 5 | 0 | 0 | 16 | 0 | 27 |
| cSH | 53 | 15 | 556 | 1700 | 1700 | 406 | 1700 |
| Volume to Capacity | 0.20 | 0.73 | 0.01 | 0.62 | 0.32 | 0.01 | 0.73 |
| Queue Length 95th (ft) | 17 | 45 | 1 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 89.6 | 473.6 | 11.5 | 0.0 | 0.0 | 14.0 | 0.0 |
| Lane LOS | F | F | B | | | B | |
| Approach Delay (s) | 89.6 | 473.6 | 0.0 | | | 0.1 | |
| Approach LOS | F | F | | | | | |

| Intersection Summary | | | |
|-----------------------------------|-------|----------------------|---|
| Average Delay | | 2.2 | |
| Intersection Capacity Utilization | 70.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis
 12: MD 108 & Meadow Vista Way/Trotter Road

2035 PM Ultimate Footprint
 7/22/2014

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------------------|--------|------|-------|----------------------|------|------|------|------|------|------|------|------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 5 | 5 | 0 | 49 | 5 | 47 | 5 | 1408 | 52 | 23 | 1099 | 10 |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 0 | 53 | 5 | 51 | 5 | 1530 | 57 | 25 | 1195 | 11 |
| Pedestrians | | | | | 1 | | | | | | | 1 |
| Lane Width (ft) | | | | | 12.0 | | | | | | | 12.0 |
| Walking Speed (ft/s) | | | | | 4.0 | | | | | | | 4.0 |
| Percent Blockage | | | | | 0 | | | | | | | 0 |
| Right turn flare (veh) | | | | | | 3 | | | | | | |
| Median type | | | | | | | | None | | | | None |
| Median storage veh | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 2815 | 2787 | 1195 | 2790 | 2798 | 1532 | 1205 | | | 1531 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 2815 | 2787 | 1195 | 2790 | 2798 | 1532 | 1205 | | | 1531 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 0 | 69 | 100 | 0 | 68 | 64 | 99 | | | 94 | | |
| cM capacity (veh/h) | 5 | 17 | 227 | 9 | 17 | 143 | 579 | | | 434 | | |
| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | NB 3 | SB 1 | SB 2 | SB 3 | | | | |
| Volume Total | 11 | 110 | 5 | 1530 | 57 | 25 | 1195 | 11 | | | | |
| Volume Left | 5 | 53 | 5 | 0 | 0 | 25 | 0 | 0 | | | | |
| Volume Right | 0 | 51 | 0 | 0 | 57 | 0 | 0 | 11 | | | | |
| cSH | 8 | 16 | 579 | 1700 | 1700 | 434 | 1700 | 1700 | | | | |
| Volume to Capacity | 1.34 | 6.79 | 0.01 | 0.90 | 0.03 | 0.06 | 0.70 | 0.01 | | | | |
| Queue Length 95th (ft) | 55 | Err | 1 | 0 | 0 | 5 | 0 | 0 | | | | |
| Control Delay (s) | 1043.6 | Err | 11.3 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 | | | | |
| Lane LOS | F | F | B | | | B | | | | | | |
| Approach Delay (s) | 1043.6 | Err | 0.0 | | | 0.3 | | | | | | |
| Approach LOS | F | F | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | |
| Average Delay | | | 376.9 | | | | | | | | | |
| Intersection Capacity Utilization | | | 91.1% | ICU Level of Service | | F | | | | | | |
| Analysis Period (min) | | | 15 | | | | | | | | | |