HCM Unsignalized Intersection Capacity Analysis
1: Old Fairhaven Pkwy & I-5 NB Ramps

Existing AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 485 | 110 | 0 | 0 | 220 | 30 | 105 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 591 | 134 | 0 | 0 | 268 | 37 | 128 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | 1 | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 305 | | | 134 | | | 1604 | 1622 | 134 | 1607 | 1604 | 287 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 305 | | | 134 | | | 1604 | 1622 | 134 | 1607 | 1604 | 287 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 52 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1245 | | | 1444 | | | 53 | 53 | 910 | 53 | 56 | 757 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 |
|---|---|---|---|---|
| Volume Total | 591 | 134 | 305 | 134 |
| Volume Left | 591 | 0 | 0 | 128 |
| Volume Right | 0 | 0 | 37 | 6 |
| cSH | 1245 | 1700 | 1700 | 55 |
| Volume to Capacity | 0.48 | 0.08 | 0.18 | 2.44 |
| Queue Length 95th (ft) | 66 | 0 | 0 | 340 |
| Control Delay (s) | 10.5 | 0.0 | 0.0 | 813.5 |
| Lane LOS | B | | | F |
| Approach Delay (s) | 8.5 | | 0.0 | 813.5 |
| Approach LOS | | | | F |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 99.0 | | | |
| Intersection Capacity Utilization | 73.7% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis
2: Old Fairhaven Pkwy & I-5 SB Ramps

Existing AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 575 | 110 | 10 | 325 | 0 | 0 | 0 | 0 | 20 | 0 | 445 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 653 | 125 | 11 | 369 | 0 | 0 | 0 | 0 | 23 | 0 | 506 |
| RTOR Reduction (vph) | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 394 | 0 |
| Lane Group Flow (vph) | 0 | 653 | 13 | 11 | 369 | 0 | 0 | 0 | 0 | 23 | 112 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 21.3 | 4.0 | 0.9 | 18.2 | | | | | 9.3 | 9.3 | |
| Effective Green, g (s) | | 22.3 | 5.0 | 1.9 | 19.2 | | | | | 10.3 | 10.3 | |
| Actuated g/C Ratio | | 0.48 | 0.11 | 0.04 | 0.41 | | | | | 0.22 | 0.22 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 876 | 167 | 72 | 769 | | | | | 377 | 338 | |
| v/s Ratio Prot | | c0.36 | | c0.01 | 0.20 | | | | | | c0.07 | |
| v/s Ratio Perm | | | 0.01 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.75 | 0.08 | 0.15 | 0.48 | | | | | 0.06 | 0.33 | |
| Uniform Delay, d1 | | 9.8 | 18.7 | 21.5 | 10.0 | | | | | 14.3 | 15.2 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.5 | 0.2 | 1.0 | 0.5 | | | | | 0.1 | 0.6 | |
| Delay (s) | | 13.3 | 18.9 | 22.5 | 10.5 | | | | | 14.4 | 15.8 | |
| Level of Service | | B | B | C | B | | | | | B | B | |
| Approach Delay (s) | | 14.2 | | | 10.8 | | | 0.0 | | | 15.7 | |
| Approach LOS | | B | | | B | | | A | | | B | |

| Intersection Summary | | | | | | |
|---|---|---|---|---|---|---|
| HCM Average Control Delay | 13.9 | HCM Level of Service | | B | | |
| HCM Volume to Capacity ratio | 0.59 | | | | | |
| Actuated Cycle Length (s) | 46.5 | Sum of lost time (s) | | 12.0 | | |
| Intersection Capacity Utilization | 73.7% | ICU Level of Service | | D | | |
| Analysis Period (min) | 15 | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

Existing AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.95 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1795 | | 1719 | 1766 | | 1703 | 1620 | | 1770 | 1761 | |
| Flt Permitted | 0.24 | 1.00 | | 0.37 | 1.00 | | 0.72 | 1.00 | | 0.64 | 1.00 | |
| Satd. Flow (perm) | 430 | 1795 | | 670 | 1766 | | 1283 | 1620 | | 1185 | 1761 | |
| Volume (vph) | 45 | 440 | 25 | 55 | 530 | 100 | 30 | 45 | 80 | 115 | 35 | 20 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 51 | 500 | 28 | 62 | 602 | 114 | 34 | 51 | 91 | 131 | 40 | 23 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 7 | 0 | 0 | 74 | 0 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 51 | 526 | 0 | 62 | 709 | 0 | 34 | 68 | 0 | 131 | 44 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 39.0 | 35.8 | | 39.0 | 35.8 | | 10.9 | 10.9 | | 10.9 | 10.9 | |
| Effective Green, g (s) | 41.0 | 36.8 | | 41.0 | 36.8 | | 11.9 | 11.9 | | 11.9 | 11.9 | |
| Actuated g/C Ratio | 0.63 | 0.57 | | 0.63 | 0.57 | | 0.18 | 0.18 | | 0.18 | 0.18 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 355 | 1018 | | 491 | 1001 | | 235 | 297 | | 217 | 323 | |
| v/s Ratio Prot | c0.01 | 0.29 | | 0.01 | c0.40 | | | 0.04 | | | 0.03 | |
| v/s Ratio Perm | 0.08 | | | 0.07 | | | 0.03 | | | c0.11 | | |
| v/c Ratio | 0.14 | 0.52 | | 0.13 | 0.71 | | 0.14 | 0.23 | | 0.60 | 0.14 | |
| Uniform Delay, d1 | 6.3 | 8.6 | | 5.1 | 10.2 | | 22.2 | 22.6 | | 24.3 | 22.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.4 | | 0.0 | 2.3 | | 0.3 | 0.4 | | 4.7 | 0.2 | |
| Delay (s) | 6.4 | 9.0 | | 5.1 | 12.5 | | 22.5 | 23.0 | | 29.0 | 22.4 | |
| Level of Service | A | A | | A | B | | C | C | | C | C | |
| Approach Delay (s) | | 8.8 | | | 11.9 | | | 22.9 | | | 26.9 | |
| Approach LOS | | A | | | B | | | C | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.7 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.64 | | | |
| Actuated Cycle Length (s) | 64.9 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 65.9% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

Existing AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 485 | 5 | 15 | 545 | 55 | 5 | 5 | 30 | 30 | 5 | 10 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 11 | 533 | 5 | 16 | 599 | 60 | 5 | 5 | 33 | 33 | 5 | 11 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 659 | | | 538 | | | 1203 | 1250 | 536 | 1253 | 1223 | 629 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 659 | | | 538 | | | 1203 | 1250 | 536 | 1253 | 1223 | 629 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 98 | | | 96 | 97 | 94 | 75 | 97 | 98 |
| cM capacity (veh/h) | 915 | | | 1020 | | | 150 | 167 | 543 | 133 | 174 | 480 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 538 | 16 | 659 | 11 | 33 | 38 | 11 |
| Volume Left | 11 | 0 | 16 | 0 | 5 | 0 | 33 | 0 |
| Volume Right | 0 | 5 | 0 | 60 | 0 | 33 | 0 | 11 |
| cSH | 915 | 1700 | 1020 | 1700 | 158 | 543 | 137 | 480 |
| Volume to Capacity | 0.01 | 0.32 | 0.02 | 0.39 | 0.07 | 0.06 | 0.28 | 0.02 |
| Queue Length 95th (ft) | 1 | 0 | 1 | 0 | 6 | 5 | 27 | 2 |
| Control Delay (s) | 9.0 | 0.0 | 8.6 | 0.0 | 29.5 | 12.1 | 41.1 | 12.7 |
| Lane LOS | A | | A | | D | B | E | B |
| Approach Delay (s) | 0.2 | | 0.2 | | 16.4 | | 34.8 | |
| Approach LOS | | | | | C | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.0 | | | |
| Intersection Capacity Utilization | 48.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

Existing AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.98 | | | 0.94 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1770 | | | 1722 | | 1736 | 1800 | | 1671 | 1745 | |
| Flt Permitted | | 0.88 | | | 0.95 | | 0.63 | 1.00 | | 0.50 | 1.00 | |
| Satd. Flow (perm) | | 1591 | | | 1654 | | 1156 | 1800 | | 879 | 1745 | |
| Volume (vph) | 30 | 30 | 10 | 20 | 40 | 45 | 50 | 275 | 30 | 25 | 175 | 10 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 32 | 32 | 11 | 22 | 43 | 48 | 54 | 296 | 32 | 27 | 188 | 11 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 0 | 29 | 0 | 0 | 6 | 0 | 0 | 4 | 0 |
| Lane Group Flow (vph) | 0 | 68 | 0 | 0 | 84 | 0 | 54 | 322 | 0 | 27 | 195 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 23.0 | | | 23.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Effective Green, g (s) | | 24.0 | | | 24.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.47 | 0.47 | | 0.47 | 0.47 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 636 | | | 662 | | 539 | 840 | | 410 | 814 | |
| v/s Ratio Prot | | | | | | | | c0.18 | | | 0.11 | |
| v/s Ratio Perm | | 0.04 | | | c0.05 | | 0.05 | | | 0.03 | | |
| v/c Ratio | | 0.11 | | | 0.13 | | 0.10 | 0.38 | | 0.07 | 0.24 | |
| Uniform Delay, d1 | | 11.3 | | | 11.4 | | 9.0 | 10.4 | | 8.8 | 9.6 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.3 | | | 0.4 | | 0.4 | 1.3 | | 0.3 | 0.7 | |
| Delay (s) | | 11.6 | | | 11.8 | | 9.3 | 11.7 | | 9.1 | 10.3 | |
| Level of Service | | B | | | B | | A | B | | A | B | |
| Approach Delay (s) | | 11.6 | | | 11.8 | | | 11.4 | | | 10.2 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 11.1 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.26 | | | |
| Actuated Cycle Length (s) | 60.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 38.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

Existing AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1606 | | 1687 | 1648 | | 1770 | 1863 | 1583 | 1687 | 1763 | |
| Flt Permitted | 0.60 | 1.00 | | 0.51 | 1.00 | | 0.68 | 1.00 | 1.00 | 0.51 | 1.00 | |
| Satd. Flow (perm) | 981 | 1606 | | 903 | 1648 | | 1262 | 1863 | 1583 | 900 | 1763 | |
| Volume (vph) | 5 | 65 | 10 | 240 | 120 | 110 | 15 | 215 | 290 | 90 | 105 | 5 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 6 | 73 | 11 | 270 | 135 | 124 | 17 | 242 | 326 | 101 | 118 | 6 |
| RTOR Reduction (vph) | 0 | 7 | 0 | 0 | 38 | 0 | 0 | 0 | 186 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 6 | 77 | 0 | 270 | 221 | 0 | 17 | 242 | 140 | 101 | 122 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 10.6 | 9.5 | | 27.3 | 21.2 | | 34.7 | 33.5 | 33.5 | 41.1 | 36.7 | |
| Effective Green, g (s) | 12.6 | 10.5 | | 28.3 | 22.2 | | 36.7 | 34.5 | 34.5 | 43.1 | 37.7 | |
| Actuated g/C Ratio | 0.16 | 0.13 | | 0.35 | 0.28 | | 0.46 | 0.43 | 0.43 | 0.54 | 0.47 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 169 | 210 | | 454 | 456 | | 591 | 801 | 681 | 537 | 829 | |
| v/s Ratio Prot | 0.00 | 0.05 | | c0.10 | 0.13 | | 0.00 | c0.13 | | c0.01 | 0.07 | |
| v/s Ratio Perm | 0.00 | | | c0.11 | | | 0.01 | | 0.09 | 0.09 | | |
| v/c Ratio | 0.04 | 0.37 | | 0.59 | 0.49 | | 0.03 | 0.30 | 0.21 | 0.19 | 0.15 | |
| Uniform Delay, d1 | 28.6 | 31.8 | | 20.1 | 24.2 | | 11.9 | 15.0 | 14.3 | 9.4 | 12.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 1.1 | | 2.1 | 0.8 | | 0.0 | 1.0 | 0.7 | 0.2 | 0.4 | |
| Delay (s) | 28.7 | 32.9 | | 22.2 | 25.0 | | 11.9 | 15.9 | 15.0 | 9.6 | 12.5 | |
| Level of Service | C | C | | C | C | | B | B | B | A | B | |
| Approach Delay (s) | | 32.6 | | | 23.6 | | | 15.3 | | | 11.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 18.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 80.2 | Sum of lost time (s) | 16.0 | |
| Intersection Capacity Utilization | 46.3% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.91 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1782 | | | | | 1807 | 1627 | | | | 1602 | |
| Flt Permitted | 0.95 | | | | | 0.98 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1782 | | | | | 1774 | 1627 | | | | 1602 | |
| Volume (vph) | 165 | 5 | 5 | 5 | 5 | 215 | 95 | 50 | 200 | 5 | 140 | 15 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 214 | 6 | 6 | 6 | 6 | 279 | 123 | 65 | 211 | 5 | 147 | 16 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 6 | 0 |
| Lane Group Flow (vph) | 226 | 0 | 0 | 0 | 0 | 291 | 351 | 0 | 0 | 0 | 162 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.7 | | | | | 22.4 | 22.4 | | | | 11.3 | |
| Effective Green, g (s) | 13.7 | | | | | 23.4 | 23.4 | | | | 12.3 | |
| Actuated g/C Ratio | 0.22 | | | | | 0.38 | 0.38 | | | | 0.20 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 398 | | | | | 676 | 620 | | | | 321 | |
| v/s Ratio Prot | c0.13 | | | | | | c0.22 | | | | c0.10 | |
| v/s Ratio Perm | | | | | | 0.16 | | | | | | |
| v/c Ratio | 0.57 | | | | | 0.43 | 0.57 | | | | 0.51 | |
| Uniform Delay, d1 | 21.2 | | | | | 14.1 | 15.0 | | | | 21.8 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 1.9 | | | | | 0.4 | 3.7 | | | | 1.3 | |
| Delay (s) | 23.1 | | | | | 14.5 | 18.7 | | | | 23.1 | |
| Level of Service | C | | | | | B | B | | | | C | |
| Approach Delay (s) | 23.1 | | | | | 14.5 | 18.7 | | | | 23.1 | |
| Approach LOS | C | | | | | B | B | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 19.2 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.55 | | | |
| Actuated Cycle Length (s) | 61.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 49.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 5 | 5 | 5 | 120 | 70 | 5 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 6 | 6 | 154 | 90 | 6 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 260 | 93 | 96 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 260 | 93 | 96 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.2 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.3 | | | |
| p0 queue free % | 99 | 99 | 100 | | | |
| cM capacity (veh/h) | 730 | 970 | 1473 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 13 | 160 | 96 |
| Volume Left | 6 | 6 | 0 |
| Volume Right | 6 | 0 | 6 |
| cSH | 833 | 1473 | 1700 |
| Volume to Capacity | 0.02 | 0.00 | 0.06 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 9.4 | 0.3 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 9.4 | 0.3 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.6 | | |
| Intersection Capacity Utilization | 20.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

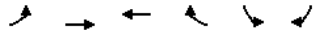
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 95 | 45 | 20 | 55 | 20 | 20 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 103 | 49 | 22 | 60 | 22 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 87 | 22 | | | 22 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 87 | 22 | | | 22 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 88 | 95 | | | 99 | |
| cM capacity (veh/h) | 894 | 1047 | | | 1543 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 103 | 49 | 22 | 60 | 43 |
| Volume Left | 103 | 0 | 0 | 0 | 22 |
| Volume Right | 0 | 49 | 0 | 60 | 0 |
| cSH | 894 | 1047 | 1700 | 1700 | 1543 |
| Volume to Capacity | 0.12 | 0.05 | 0.01 | 0.04 | 0.01 |
| Queue Length 95th (ft) | 10 | 4 | 0 | 0 | 1 |
| Control Delay (s) | 9.6 | 8.6 | 0.0 | 0.0 | 3.7 |
| Lane LOS | A | A | | | A |
| Approach Delay (s) | 9.2 | | 0.0 | | 3.7 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.7 | | |
| Intersection Capacity Utilization | 20.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 45 | 5 | 5 | 30 | 5 | 20 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 54 | 6 | 6 | 36 | 6 | 24 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 42 | | | | 137 | 24 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 42 | | | | 137 | 24 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 97 | | | | 99 | 98 |
| cM capacity (veh/h) | 1580 | | | | 814 | 1036 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 60 | 42 | 30 |
| Volume Left | 54 | 0 | 6 |
| Volume Right | 0 | 36 | 24 |
| cSH | 1580 | 1700 | 982 |
| Volume to Capacity | 0.03 | 0.02 | 0.03 |
| Queue Length 95th (ft) | 3 | 0 | 2 |
| Control Delay (s) | 6.6 | 0.0 | 8.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.6 | 0.0 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.0 | | |
| Intersection Capacity Utilization | 19.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 125 | 5 | 5 | 75 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 136 | 5 | 5 | 82 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 231 | 139 | | | 141 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 231 | 139 | | | 141 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 754 | 910 | | | 1442 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 141 | 87 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 825 | 1700 | 1442 |
| Volume to Capacity | 0.01 | 0.08 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 9.4 | 0.0 | 0.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.4 | 0.0 | 0.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.6 | | |
| Intersection Capacity Utilization | 18.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — Existing PM Peak
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 615 | 270 | 0 | 0 | 175 | 45 | 160 | 0 | 15 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 661 | 290 | 0 | 0 | 188 | 48 | 172 | 0 | 16 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 237 | | | 290 | | | 1825 | 1849 | 290 | 1841 | 1825 | 212 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 237 | | | 290 | | | 1825 | 1849 | 290 | 1841 | 1825 | 212 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 50 | | | 100 | | | 0 | 100 | 98 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1331 | | | 1277 | | | 36 | 37 | 749 | 35 | 39 | 833 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 661 | 290 | 237 | 172 | 16 |
| Volume Left | 661 | 0 | 0 | 172 | 0 |
| Volume Right | 0 | 0 | 48 | 0 | 16 |
| cSH | 1331 | 1700 | 1700 | 36 | 749 |
| Volume to Capacity | 0.50 | 0.17 | 0.14 | 4.76 | 0.02 |
| Queue Length 95th (ft) | 72 | 0 | 0 | Err | 2 |
| Control Delay (s) | 10.3 | 0.0 | 0.0 | Err | 9.9 |
| Lane LOS | B | | | F | A |
| Approach Delay (s) | 7.2 | | 0.0 | 9142.8 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1255.0 | | | |
| Intersection Capacity Utilization | 101.8% | ICU Level of Service | G | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — Existing PM Peak
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.35 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 655 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 785 | 150 | 15 | 305 | 0 | 0 | 0 | 0 | 65 | 0 | 600 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 809 | 155 | 15 | 314 | 0 | 0 | 0 | 0 | 67 | 0 | 619 |
| RTOR Reduction (vph) | 0 | 0 | 132 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 472 | 0 |
| Lane Group Flow (vph) | 0 | 809 | 23 | 15 | 314 | 0 | 0 | 0 | 0 | 67 | 147 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 25.8 | 5.8 | 15.0 | 15.0 | | | | | 9.8 | 9.8 | |
| Effective Green, g (s) | | 26.8 | 6.8 | 16.0 | 16.0 | | | | | 10.8 | 10.8 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.35 | 0.35 | | | | | 0.24 | 0.24 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1095 | 236 | 230 | 660 | | | | | 419 | 375 | |
| v/s Ratio Prot | | c0.43 | 0.01 | | 0.17 | | | | | | c0.09 | |
| v/s Ratio Perm | | | | 0.02 | | | | | | 0.04 | | |
| v/c Ratio | | 0.74 | 0.10 | 0.07 | 0.48 | | | | | 0.16 | 0.39 | |
| Uniform Delay, d1 | | 6.8 | 16.8 | 9.8 | 11.5 | | | | | 13.8 | 14.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 2.6 | 0.2 | 0.1 | 0.5 | | | | | 0.2 | 0.7 | |
| Delay (s) | | 9.5 | 16.9 | 10.0 | 12.1 | | | | | 14.0 | 15.3 | |
| Level of Service | | A | B | A | B | | | | | B | B | |
| Approach Delay (s) | | 10.7 | | | 12.0 | | | 0.0 | | | 15.2 | |
| Approach LOS | | B | | | B | | | A | | | B | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| HCM Average Control Delay | 12.5 | HCM Level of Service | | B | |
| HCM Volume to Capacity ratio | 0.64 | | | | |
| Actuated Cycle Length (s) | 45.6 | Sum of lost time (s) | | 8.0 | |
| Intersection Capacity Utilization | 101.8% | ICU Level of Service | | G | |
| Analysis Period (min) | 15 | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

Existing PM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1843 | | 1770 | 1837 | | 1787 | 1688 | | 1770 | 1707 | |
| Flt Permitted | 0.18 | 1.00 | | 0.22 | 1.00 | | 0.67 | 1.00 | | 0.68 | 1.00 | |
| Satd. Flow (perm) | 329 | 1843 | | 409 | 1837 | | 1260 | 1688 | | 1270 | 1707 | |
| Volume (vph) | 65 | 605 | 45 | 75 | 640 | 65 | 45 | 35 | 75 | 185 | 55 | 70 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 69 | 644 | 48 | 80 | 681 | 69 | 48 | 37 | 80 | 197 | 59 | 74 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 61 | 0 | 0 | 57 | 0 |
| Lane Group Flow (vph) | 69 | 689 | 0 | 80 | 746 | 0 | 48 | 56 | 0 | 197 | 76 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 36.7 | 33.5 | | 36.7 | 33.5 | | 14.3 | 14.3 | | 14.3 | 14.3 | |
| Effective Green, g (s) | 38.7 | 34.5 | | 38.7 | 34.5 | | 15.3 | 15.3 | | 15.3 | 15.3 | |
| Actuated g/C Ratio | 0.59 | 0.52 | | 0.59 | 0.52 | | 0.23 | 0.23 | | 0.23 | 0.23 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 285 | 963 | | 326 | 960 | | 292 | 391 | | 294 | 396 | |
| v/s Ratio Prot | 0.02 | 0.37 | | c0.02 | c0.41 | | | 0.03 | | | 0.04 | |
| v/s Ratio Perm | 0.13 | | | 0.13 | | | 0.04 | | | c0.16 | | |
| v/c Ratio | 0.24 | 0.72 | | 0.25 | 0.78 | | 0.16 | 0.14 | | 0.67 | 0.19 | |
| Uniform Delay, d1 | 8.7 | 12.0 | | 8.0 | 12.7 | | 20.2 | 20.1 | | 23.1 | 20.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 2.5 | | 0.1 | 4.0 | | 0.3 | 0.2 | | 5.9 | 0.2 | |
| Delay (s) | 8.9 | 14.6 | | 8.1 | 16.7 | | 20.5 | 20.3 | | 28.9 | 20.6 | |
| Level of Service | A | B | | A | B | | C | C | | C | C | |
| Approach Delay (s) | | 14.0 | | | 15.8 | | | 20.4 | | | 25.6 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 17.1 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.70 | | | |
| Actuated Cycle Length (s) | 66.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 72.7% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

Existing PM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 705 | 10 | 25 | 695 | 40 | 10 | 5 | 15 | 45 | 5 | 10 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 5 | 719 | 10 | 26 | 709 | 41 | 10 | 5 | 15 | 46 | 5 | 10 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 750 | | | 730 | | | 1508 | 1536 | 724 | 1528 | 1520 | 730 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 750 | | | 730 | | | 1508 | 1536 | 724 | 1528 | 1520 | 730 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 97 | | | 89 | 95 | 96 | 48 | 96 | 98 |
| cM capacity (veh/h) | 859 | | | 879 | | | 91 | 111 | 424 | 88 | 116 | 426 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 5 | 730 | 26 | 750 | 15 | 15 | 51 | 10 |
| Volume Left | 5 | 0 | 26 | 0 | 10 | 0 | 46 | 0 |
| Volume Right | 0 | 10 | 0 | 41 | 0 | 15 | 0 | 10 |
| cSH | 859 | 1700 | 879 | 1700 | 97 | 424 | 90 | 426 |
| Volume to Capacity | 0.01 | 0.43 | 0.03 | 0.44 | 0.16 | 0.04 | 0.57 | 0.02 |
| Queue Length 95th (ft) | 0 | 0 | 2 | 0 | 13 | 3 | 64 | 2 |
| Control Delay (s) | 9.2 | 0.0 | 9.2 | 0.0 | 49.2 | 13.8 | 87.9 | 13.7 |
| Lane LOS | A | | A | | E | B | F | B |
| Approach Delay (s) | 0.1 | | 0.3 | | 31.5 | | 75.5 | |
| Approach LOS | | | | | D | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.7 | | | |
| Intersection Capacity Utilization | 55.7% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

Existing PM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.96 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1804 | | | 1762 | | 1805 | 1854 | | 1805 | 1890 | |
| Flt Permitted | | 0.82 | | | 0.91 | | 0.37 | 1.00 | | 0.46 | 1.00 | |
| Satd. Flow (perm) | | 1502 | | | 1615 | | 709 | 1854 | | 875 | 1890 | |
| Volume (vph) | 85 | 70 | 45 | 35 | 70 | 50 | 45 | 280 | 55 | 95 | 405 | 15 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 93 | 77 | 49 | 38 | 77 | 55 | 49 | 308 | 60 | 104 | 445 | 16 |
| RTOR Reduction (vph) | 0 | 17 | 0 | 0 | 29 | 0 | 0 | 12 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 0 | 202 | 0 | 0 | 141 | 0 | 49 | 356 | 0 | 104 | 459 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 23.0 | | | 23.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Effective Green, g (s) | | 24.0 | | | 24.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.47 | 0.47 | | 0.47 | 0.47 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 601 | | | 646 | | 331 | 865 | | 408 | 882 | |
| v/s Ratio Prot | | | | | | | | 0.19 | | | c0.24 | |
| v/s Ratio Perm | | c0.13 | | | 0.09 | | 0.07 | | | 0.12 | | |
| v/c Ratio | | 0.34 | | | 0.22 | | 0.15 | 0.41 | | 0.25 | 0.52 | |
| Uniform Delay, d1 | | 12.5 | | | 11.8 | | 9.2 | 10.6 | | 9.7 | 11.3 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 1.5 | | | 0.8 | | 0.9 | 1.4 | | 1.5 | 2.2 | |
| Delay (s) | | 14.0 | | | 12.6 | | 10.1 | 12.0 | | 11.2 | 13.5 | |
| Level of Service | | B | | | B | | B | B | | B | B | |
| Approach Delay (s) | | 14.0 | | | 12.6 | | | 11.8 | | | 13.0 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 12.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 60.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 55.0% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

Existing PM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1764 | | 1787 | 1702 | | 1805 | 1900 | 1615 | 1787 | 1866 | |
| Flt Permitted | 0.59 | 1.00 | | 0.44 | 1.00 | | 0.58 | 1.00 | 1.00 | 0.50 | 1.00 | |
| Satd. Flow (perm) | 1054 | 1764 | | 826 | 1702 | | 1100 | 1900 | 1615 | 939 | 1866 | |
| Volume (vph) | 5 | 125 | 15 | 235 | 95 | 165 | 20 | 195 | 175 | 195 | 260 | 15 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 5 | 134 | 16 | 253 | 102 | 177 | 22 | 210 | 188 | 210 | 280 | 16 |
| RTOR Reduction (vph) | 0 | 5 | 0 | 0 | 69 | 0 | 0 | 0 | 120 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 5 | 145 | 0 | 253 | 210 | 0 | 22 | 210 | 68 | 210 | 294 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.9 | 11.9 | | 27.2 | 21.2 | | 28.6 | 26.3 | 26.3 | 38.0 | 31.0 | |
| Effective Green, g (s) | 14.9 | 12.9 | | 28.2 | 22.2 | | 30.6 | 27.3 | 27.3 | 39.3 | 32.0 | |
| Actuated g/C Ratio | 0.20 | 0.17 | | 0.37 | 0.29 | | 0.41 | 0.36 | 0.36 | 0.52 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 225 | 301 | | 452 | 500 | | 477 | 687 | 584 | 579 | 791 | |
| v/s Ratio Prot | 0.00 | 0.08 | | c0.08 | 0.12 | | 0.00 | 0.11 | | c0.04 | c0.16 | |
| v/s Ratio Perm | 0.00 | | | c0.13 | | | 0.02 | | 0.04 | 0.15 | | |
| v/c Ratio | 0.02 | 0.48 | | 0.56 | 0.42 | | 0.05 | 0.31 | 0.12 | 0.36 | 0.37 | |
| Uniform Delay, d1 | 24.4 | 28.3 | | 17.5 | 21.5 | | 13.5 | 17.3 | 16.1 | 10.2 | 14.9 | |
| 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 | 1.2 | | 1.5 | 0.6 | | 0.0 | 1.1 | 0.4 | 0.4 | 1.3 | |
| Delay (s) | 24.4 | 29.5 | | 19.0 | 22.0 | | 13.6 | 18.4 | 16.5 | 10.5 | 16.2 | |
| Level of Service | C | C | | B | C | | B | B | B | B | B | |
| Approach Delay (s) | | 29.3 | | | 20.6 | | | 17.3 | | | 13.9 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 18.5 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 75.5 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 54.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.94 | | | | 0.98 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1779 | | | | | 1860 | 1772 | | | | 1791 | |
| Flt Permitted | 0.96 | | | | | 0.93 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1779 | | | | | 1726 | 1772 | | | | 1791 | |
| Volume (vph) | 125 | 5 | 5 | 5 | 5 | 295 | 345 | 55 | 205 | 5 | 70 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 136 | 5 | 5 | 5 | 5 | 321 | 375 | 60 | 223 | 5 | 76 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 146 | 0 | 0 | 0 | 0 | 331 | 638 | 0 | 0 | 0 | 84 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 9.7 | | | | | 22.2 | 22.2 | | | | 8.1 | |
| Effective Green, g (s) | 10.7 | | | | | 23.2 | 23.2 | | | | 9.1 | |
| Actuated g/C Ratio | 0.19 | | | | | 0.42 | 0.42 | | | | 0.17 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 346 | | | | | 728 | 747 | | | | 296 | |
| v/s Ratio Prot | c0.08 | | | | | | c0.36 | | | | c0.05 | |
| v/s Ratio Perm | | | | | | 0.19 | | | | | | |
| v/c Ratio | 0.42 | | | | | 0.45 | 0.85 | | | | 0.29 | |
| Uniform Delay, d1 | 19.4 | | | | | 11.4 | 14.4 | | | | 20.1 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 0.8 | | | | | 0.5 | 11.9 | | | | 0.5 | |
| Delay (s) | 20.3 | | | | | 11.8 | 26.3 | | | | 20.6 | |
| Level of Service | C | | | | | B | C | | | | C | |
| Approach Delay (s) | 20.3 | | | | | 11.8 | 26.3 | | | | 20.6 | |
| Approach LOS | C | | | | | B | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 21.2 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.63 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 56.6% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 10 | 10 | 10 | 185 | 165 | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 11 | 11 | 195 | 174 | 5 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 392 | 176 | 179 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 392 | 176 | 179 | | | |
| tC, single (s) | 6.5 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.6 | 3.4 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 600 | 857 | 1397 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 21 | 205 | 179 |
| Volume Left | 11 | 11 | 0 |
| Volume Right | 11 | 0 | 5 |
| cSH | 706 | 1397 | 1700 |
| Volume to Capacity | 0.03 | 0.01 | 0.11 |
| Queue Length 95th (ft) | 2 | 1 | 0 |
| Control Delay (s) | 10.3 | 0.5 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 10.3 | 0.5 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.8 | | |
| Intersection Capacity Utilization | 27.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

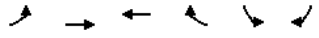
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 145 | 45 | 30 | 120 | 45 | 30 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 154 | 48 | 32 | 128 | 48 | 32 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 160 | 32 | | | 32 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 160 | 32 | | | 32 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 81 | 95 | | | 97 | |
| cM capacity (veh/h) | 808 | 1045 | | | 1574 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 154 | 48 | 32 | 128 | 80 |
| Volume Left | 154 | 0 | 0 | 0 | 48 |
| Volume Right | 0 | 48 | 0 | 128 | 0 |
| cSH | 808 | 1045 | 1700 | 1700 | 1574 |
| Volume to Capacity | 0.19 | 0.05 | 0.02 | 0.08 | 0.03 |
| Queue Length 95th (ft) | 18 | 4 | 0 | 0 | 2 |
| Control Delay (s) | 10.5 | 8.6 | 0.0 | 0.0 | 4.5 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 10.1 | | 0.0 | | 4.5 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.4 | | |
| Intersection Capacity Utilization | 25.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 40 | 10 | 5 | 5 | 35 | 35 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 46 | 11 | 6 | 6 | 40 | 40 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 112 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 112 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 95 | 96 |
| cM capacity (veh/h) | 1595 | | | | 864 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 57 | 11 | 80 |
| Volume Left | 46 | 0 | 40 |
| Volume Right | 0 | 6 | 40 |
| cSH | 1595 | 1700 | 960 |
| Volume to Capacity | 0.03 | 0.01 | 0.08 |
| Queue Length 95th (ft) | 2 | 0 | 7 |
| Control Delay (s) | 5.9 | 0.0 | 9.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 5.9 | 0.0 | 9.1 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.2 | | |
| Intersection Capacity Utilization | 20.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 185 | 5 | 5 | 165 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 201 | 5 | 5 | 179 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 394 | 204 | | | 207 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 394 | 204 | | | 207 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 608 | 837 | | | 1365 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 207 | 185 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 704 | 1700 | 1365 |
| Volume to Capacity | 0.02 | 0.12 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 10.2 | 0.0 | 0.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.2 | 0.0 | 0.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.4 | |
| Intersection Capacity Utilization | | 22.7% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

HCM Unsignalized Intersection Capacity Analysis — 2022 Baseline AM Peak
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 625 | 140 | 0 | 0 | 275 | 35 | 135 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 762 | 171 | 0 | 0 | 335 | 43 | 165 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | 1 | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 378 | | | 171 | | | 2052 | 2073 | 171 | 2055 | 2052 | 357 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 378 | | | 171 | | | 2052 | 2073 | 171 | 2055 | 2052 | 357 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 35 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1170 | | | 1400 | | | 19 | 19 | 868 | 20 | 20 | 692 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 |
|---|---|---|---|---|
| Volume Total | 762 | 171 | 378 | 171 |
| Volume Left | 762 | 0 | 0 | 165 |
| Volume Right | 0 | 0 | 43 | 6 |
| cSH | 1170 | 1700 | 1700 | 20 |
| Volume to Capacity | 0.65 | 0.10 | 0.22 | 8.55 |
| Queue Length 95th (ft) | 128 | 0 | 0 | Err |
| Control Delay (s) | 13.6 | 0.0 | 0.0 | Err |
| Lane LOS | B | | | F |
| Approach Delay (s) | 11.1 | | 0.0 | Err |
| Approach LOS | | | | F |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1159.2 | | | |
| Intersection Capacity Utilization | 88.0% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 Baseline AM Peak
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 700 | 135 | 10 | 400 | 0 | 0 | 0 | 0 | 20 | 0 | 570 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 795 | 153 | 11 | 455 | 0 | 0 | 0 | 0 | 23 | 0 | 648 |
| RTOR Reduction (vph) | 0 | 0 | 115 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 351 | 0 |
| Lane Group Flow (vph) | 0 | 795 | 38 | 11 | 455 | 0 | 0 | 0 | 0 | 23 | 297 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 29.0 | 6.2 | 1.0 | 23.8 | | | | | 14.4 | 14.4 | |
| Effective Green, g (s) | | 30.0 | 7.2 | 2.0 | 24.8 | | | | | 15.4 | 15.4 | |
| Actuated g/C Ratio | | 0.51 | 0.12 | 0.03 | 0.42 | | | | | 0.26 | 0.26 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 923 | 188 | 60 | 778 | | | | | 442 | 395 | |
| v/s Ratio Prot | | c0.44 | | 0.01 | 0.24 | | | | | | c0.19 | |
| v/s Ratio Perm | | | c0.02 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.86 | 0.20 | 0.18 | 0.58 | | | | | 0.05 | 0.75 | |
| Uniform Delay, d1 | | 12.9 | 23.5 | 27.9 | 13.3 | | | | | 16.5 | 20.2 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 8.3 | 0.5 | 1.5 | 1.1 | | | | | 0.0 | 7.9 | |
| Delay (s) | | 21.2 | 24.0 | 29.4 | 14.5 | | | | | 16.6 | 28.1 | |
| Level of Service | | C | C | C | B | | | | | B | C | |
| Approach Delay (s) | | 21.6 | | | 14.8 | | | 0.0 | | | 27.7 | |
| Approach LOS | | C | | | B | | | A | | | C | |

| Intersection Summary | | | | | | |
|---|---|---|---|---|---|---|
| HCM Average Control Delay | 22.1 | HCM Level of Service | | C | | |
| HCM Volume to Capacity ratio | 0.80 | | | | | |
| Actuated Cycle Length (s) | 59.4 | Sum of lost time (s) | | 12.0 | | |
| Intersection Capacity Utilization | 88.0% | ICU Level of Service | | E | | |
| Analysis Period (min) | 15 | | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 Baseline AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1796 | | 1719 | 1769 | | 1703 | 1618 | | 1770 | 1756 | |
| Flt Permitted | 0.14 | 1.00 | | 0.28 | 1.00 | | 0.71 | 1.00 | | 0.50 | 1.00 | |
| Satd. Flow (perm) | 254 | 1796 | | 506 | 1769 | | 1272 | 1618 | | 929 | 1756 | |
| Volume (vph) | 55 | 570 | 30 | 65 | 680 | 120 | 40 | 55 | 100 | 140 | 40 | 25 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 62 | 648 | 34 | 74 | 773 | 136 | 45 | 62 | 114 | 159 | 45 | 28 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 80 | 0 | 0 | 23 | 0 |
| Lane Group Flow (vph) | 62 | 680 | 0 | 74 | 903 | 0 | 45 | 96 | 0 | 159 | 50 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 54.5 | 50.0 | | 54.5 | 50.0 | | 14.0 | 14.0 | | 14.0 | 14.0 | |
| Effective Green, g (s) | 56.5 | 51.0 | | 56.5 | 51.0 | | 15.0 | 15.0 | | 15.0 | 15.0 | |
| Actuated g/C Ratio | 0.68 | 0.61 | | 0.68 | 0.61 | | 0.18 | 0.18 | | 0.18 | 0.18 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 268 | 1097 | | 422 | 1080 | | 229 | 291 | | 167 | 315 | |
| v/s Ratio Prot | c0.02 | 0.38 | | 0.01 | c0.51 | | | 0.06 | | | 0.03 | |
| v/s Ratio Perm | 0.14 | | | 0.11 | | | 0.04 | | | c0.17 | | |
| v/c Ratio | 0.23 | 0.62 | | 0.18 | 0.84 | | 0.20 | 0.33 | | 0.95 | 0.16 | |
| Uniform Delay, d1 | 10.2 | 10.2 | | 6.2 | 12.9 | | 29.1 | 29.9 | | 33.9 | 28.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 1.1 | | 0.1 | 5.7 | | 0.4 | 0.7 | | 55.3 | 0.2 | |
| Delay (s) | 10.4 | 11.2 | | 6.3 | 18.7 | | 29.5 | 30.5 | | 89.2 | 29.2 | |
| Level of Service | B | B | | A | B | | C | C | | F | C | |
| Approach Delay (s) | | 11.2 | | | 17.7 | | | 30.3 | | | 70.3 | |
| Approach LOS | | B | | | B | | | C | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 22.4 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.81 | | | |
| Actuated Cycle Length (s) | 83.5 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 78.2% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



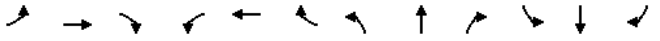
HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 Baseline AM Peak
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 625 | 5 | 15 | 700 | 65 | 5 | 5 | 40 | 35 | 5 | 15 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 11 | 687 | 5 | 16 | 769 | 71 | 5 | 5 | 44 | 38 | 5 | 16 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 841 | | | 692 | | | 1533 | 1585 | 690 | 1593 | 1552 | 805 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 841 | | | 692 | | | 1533 | 1585 | 690 | 1593 | 1552 | 805 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 98 | | | 94 | 95 | 90 | 47 | 95 | 96 |
| cM capacity (veh/h) | 782 | | | 894 | | | 85 | 104 | 444 | 72 | 109 | 381 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 692 | 16 | 841 | 11 | 44 | 44 | 16 |
| Volume Left | 11 | 0 | 16 | 0 | 5 | 0 | 38 | 0 |
| Volume Right | 0 | 5 | 0 | 71 | 0 | 44 | 0 | 16 |
| cSH | 782 | 1700 | 894 | 1700 | 94 | 444 | 76 | 381 |
| Volume to Capacity | 0.01 | 0.41 | 0.02 | 0.49 | 0.12 | 0.10 | 0.58 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 1 | 0 | 10 | 8 | 63 | 3 |
| Control Delay (s) | 9.7 | 0.0 | 9.1 | 0.0 | 48.5 | 14.0 | 104.4 | 14.9 |
| Lane LOS | A | | A | | E | B | F | B |
| Approach Delay (s) | 0.2 | | 0.2 | | 20.9 | | 80.0 | |
| Approach LOS | | | | | C | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.7 | | | |
| Intersection Capacity Utilization | 57.4% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |



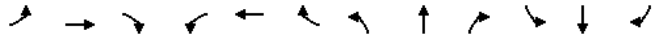
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1722 | | 1736 | 1799 | | 1671 | 1732 | |
| Flt Permitted | | 0.85 | | | 0.94 | | 0.57 | 1.00 | | 0.39 | 1.00 | |
| Satd. Flow (perm) | | 1512 | | | 1639 | | 1038 | 1799 | | 691 | 1732 | |
| Volume (vph) | 55 | 45 | 30 | 25 | 55 | 60 | 70 | 355 | 40 | 30 | 220 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 27 | 59 | 65 | 75 | 382 | 43 | 32 | 237 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 8 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 113 | 0 | 75 | 417 | 0 | 32 | 256 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 635 | | | 688 | | 436 | 756 | | 290 | 727 | |
| v/s Ratio Prot | | | | | | | | c0.23 | | | 0.15 | |
| v/s Ratio Perm | | c0.08 | | | 0.07 | | 0.07 | | | 0.05 | | |
| v/c Ratio | | 0.19 | | | 0.16 | | 0.17 | 0.55 | | 0.11 | 0.35 | |
| Uniform Delay, d1 | | 9.1 | | | 9.0 | | 9.1 | 10.9 | | 8.8 | 9.9 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.5 | | 0.9 | 2.9 | | 0.8 | 1.3 | |
| Delay (s) | | 9.8 | | | 9.5 | | 9.9 | 13.8 | | 9.6 | 11.2 | |
| Level of Service | | A | | | A | | A | B | | A | B | |
| Approach Delay (s) | | 9.8 | | | 9.5 | | | 13.2 | | | 11.0 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 11.7 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.37 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 50.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1599 | | 1687 | 1634 | | 1770 | 1863 | 1583 | 1687 | 1758 | |
| Flt Permitted | 0.55 | 1.00 | | 0.52 | 1.00 | | 0.65 | 1.00 | 1.00 | 0.43 | 1.00 | |
| Satd. Flow (perm) | 895 | 1599 | | 931 | 1634 | | 1218 | 1863 | 1583 | 757 | 1758 | |
| Volume (vph) | 10 | 80 | 15 | 295 | 150 | 170 | 20 | 270 | 355 | 145 | 135 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 17 | 331 | 169 | 191 | 22 | 303 | 399 | 163 | 152 | 11 |
| RTOR Reduction (vph) | 0 | 10 | 0 | 0 | 54 | 0 | 0 | 0 | 252 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 11 | 97 | 0 | 331 | 306 | 0 | 22 | 303 | 147 | 163 | 160 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.8 | 11.8 | | 26.6 | 20.6 | | 27.4 | 25.3 | 25.3 | 32.0 | 27.6 | |
| Effective Green, g (s) | 14.8 | 12.8 | | 27.6 | 21.6 | | 29.4 | 26.3 | 26.3 | 34.0 | 28.6 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.30 | | 0.41 | 0.37 | 0.37 | 0.48 | 0.40 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 204 | 287 | | 475 | 495 | | 526 | 687 | 584 | 431 | 705 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.11 | 0.19 | | 0.00 | c0.16 | | c0.03 | 0.09 | |
| v/s Ratio Perm | 0.01 | | | c0.16 | | | 0.02 | | 0.09 | 0.15 | | |
| v/c Ratio | 0.05 | 0.34 | | 0.70 | 0.62 | | 0.04 | 0.44 | 0.25 | 0.38 | 0.23 | |
| Uniform Delay, d1 | 22.5 | 25.6 | | 16.8 | 21.3 | | 12.5 | 17.0 | 15.7 | 11.3 | 14.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 4.4 | 2.3 | | 0.0 | 2.1 | 1.0 | 0.6 | 0.7 | |
| Delay (s) | 22.7 | 26.3 | | 21.2 | 23.6 | | 12.5 | 19.0 | 16.7 | 11.8 | 14.8 | |
| Level of Service | C | C | | C | C | | B | B | B | B | B | |
| Approach Delay (s) | | 25.9 | | | 22.5 | | | 17.5 | | | 13.3 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 19.2 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.59 | | | |
| Actuated Cycle Length (s) | 71.3 | Sum of lost time (s) | 16.0 | |
| Intersection Capacity Utilization | 55.3% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.91 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1784 | | | | | 1807 | 1625 | | | | 1604 | |
| Flt Permitted | 0.95 | | | | | 0.98 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1784 | | | | | 1775 | 1625 | | | | 1604 | |
| Volume (vph) | 205 | 5 | 5 | 5 | 5 | 265 | 115 | 65 | 245 | 5 | 215 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 6 | 6 | 6 | 6 | 344 | 149 | 84 | 258 | 5 | 226 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 278 | 0 | 0 | 0 | 0 | 356 | 441 | 0 | 0 | 0 | 247 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 14.5 | | | | | 24.3 | 24.3 | | | | 14.3 | |
| Effective Green, g (s) | 15.5 | | | | | 25.3 | 25.3 | | | | 15.3 | |
| Actuated g/C Ratio | 0.23 | | | | | 0.37 | 0.37 | | | | 0.22 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 406 | | | | | 659 | 604 | | | | 360 | |
| v/s Ratio Prot | c0.16 | | | | | | c0.27 | | | | c0.15 | |
| v/s Ratio Perm | | | | | | 0.20 | | | | | | |
| v/c Ratio | 0.68 | | | | | 0.54 | 0.73 | | | | 0.69 | |
| Uniform Delay, d1 | 24.1 | | | | | 16.8 | 18.5 | | | | 24.2 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 4.7 | | | | | 0.9 | 7.6 | | | | 5.4 | |
| Delay (s) | 28.8 | | | | | 17.7 | 26.0 | | | | 29.6 | |
| Level of Service | C | | | | | B | C | | | | C | |
| Approach Delay (s) | 28.8 | | | | | 17.7 | 26.0 | | | | 29.6 | |
| Approach LOS | C | | | | | B | C | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 25.1 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 68.1 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 60.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 5 | 5 | 5 | 150 | 90 | 5 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 6 | 6 | 192 | 115 | 6 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 324 | 119 | 122 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 324 | 119 | 122 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.2 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.3 | | | |
| p0 queue free % | 99 | 99 | 100 | | | |
| cM capacity (veh/h) | 671 | 939 | 1441 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 13 | 199 | 122 |
| Volume Left | 6 | 6 | 0 |
| Volume Right | 6 | 0 | 6 |
| cSH | 783 | 1441 | 1700 |
| Volume to Capacity | 0.02 | 0.00 | 0.07 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 9.7 | 0.3 | 0.0 |
| Lane LOS | A | A | |
| Approach Delay (s) | 9.7 | 0.3 | 0.0 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 21.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

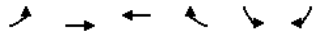
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 115 | 55 | 25 | 70 | 25 | 25 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 125 | 60 | 27 | 76 | 27 | 27 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 109 | 27 | | | 27 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 109 | 27 | | | 27 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 86 | 94 | | | 98 | |
| cM capacity (veh/h) | 866 | 1040 | | | 1536 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 125 | 60 | 27 | 76 | 54 |
| Volume Left | 125 | 0 | 0 | 0 | 27 |
| Volume Right | 0 | 60 | 0 | 76 | 0 |
| cSH | 866 | 1040 | 1700 | 1700 | 1536 |
| Volume to Capacity | 0.14 | 0.06 | 0.02 | 0.04 | 0.02 |
| Queue Length 95th (ft) | 13 | 5 | 0 | 0 | 1 |
| Control Delay (s) | 9.9 | 8.7 | 0.0 | 0.0 | 3.8 |
| Lane LOS | A | A | | | A |
| Approach Delay (s) | 9.5 | | 0.0 | | 3.8 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.7 | | |
| Intersection Capacity Utilization | 22.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 55 | 5 | 5 | 35 | 5 | 25 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 65 | 6 | 6 | 42 | 6 | 30 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 164 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 164 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 96 | | | | 99 | 97 |
| cM capacity (veh/h) | 1573 | | | | 779 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 71 | 48 | 36 |
| Volume Left | 65 | 0 | 6 |
| Volume Right | 0 | 42 | 30 |
| cSH | 1573 | 1700 | 979 |
| Volume to Capacity | 0.04 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 3 | 0 | 3 |
| Control Delay (s) | 6.8 | 0.0 | 8.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.8 | 0.0 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.2 | | |
| Intersection Capacity Utilization | 20.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 155 | 5 | 5 | 90 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 168 | 5 | 5 | 98 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 280 | 171 | | | 174 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 280 | 171 | | | 174 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 707 | 873 | | | 1403 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 174 | 103 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 781 | 1700 | 1403 |
| Volume to Capacity | 0.01 | 0.10 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 9.7 | 0.0 | 0.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.7 | 0.0 | 0.4 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 18.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 Baseline PM Peak
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 805 | 340 | 0 | 0 | 225 | 55 | 205 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 866 | 366 | 0 | 0 | 242 | 59 | 220 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 301 | | | 366 | | | 2368 | 2398 | 366 | 2390 | 2368 | 272 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 301 | | | 366 | | | 2368 | 2398 | 366 | 2390 | 2368 | 272 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 31 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1260 | | | 1199 | | | 11 | 10 | 680 | 10 | 11 | 772 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 866 | 366 | 301 | 220 | 22 |
| Volume Left | 866 | 0 | 0 | 220 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1260 | 1700 | 1700 | 11 | 680 |
| Volume to Capacity | 0.69 | 0.22 | 0.18 | 20.41 | 0.03 |
| Queue Length 95th (ft) | 147 | 0 | 0 | Err | 2 |
| Control Delay (s) | 13.9 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | B | | | F | B |
| Approach Delay (s) | 9.8 | | 0.0 | 9111.1 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1249.2 | | | |
| Intersection Capacity Utilization | 128.4% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 Baseline PM Peak
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.16 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 302 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 970 | 190 | 20 | 380 | 0 | 0 | 0 | 0 | 80 | 0 | 780 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1000 | 196 | 21 | 392 | 0 | 0 | 0 | 0 | 82 | 0 | 804 |
| RTOR Reduction (vph) | 0 | 0 | 142 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 451 | 0 |
| Lane Group Flow (vph) | 0 | 1000 | 54 | 21 | 392 | 0 | 0 | 0 | 0 | 82 | 353 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 35.4 | 6.5 | 23.9 | 23.9 | | | | | 15.3 | 15.3 | |
| Effective Green, g (s) | | 36.4 | 7.5 | 24.9 | 24.9 | | | | | 16.3 | 16.3 | |
| Actuated g/C Ratio | | 0.60 | 0.12 | 0.41 | 0.41 | | | | | 0.27 | 0.27 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1117 | 196 | 124 | 772 | | | | | 475 | 425 | |
| v/s Ratio Prot | | c0.54 | 0.03 | | 0.21 | | | | | | c0.22 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.90 | 0.28 | 0.17 | 0.51 | | | | | 0.17 | 0.83 | |
| Uniform Delay, d1 | | 10.5 | 24.1 | 11.3 | 13.3 | | | | | 17.0 | 20.9 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 9.5 | 0.8 | 0.6 | 0.5 | | | | | 0.2 | 12.6 | |
| Delay (s) | | 20.0 | 24.9 | 12.0 | 13.9 | | | | | 17.2 | 33.5 | |
| Level of Service | | B | C | B | B | | | | | B | C | |
| Approach Delay (s) | | 20.8 | | | 13.8 | | | 0.0 | | | 32.0 | |
| Approach LOS | | C | | | B | | | A | | | C | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| HCM Average Control Delay | 23.6 | HCM Level of Service | | C | |
| HCM Volume to Capacity ratio | 0.87 | | | | |
| Actuated Cycle Length (s) | 60.7 | Sum of lost time (s) | | 8.0 | |
| Intersection Capacity Utilization | 128.4% | ICU Level of Service | | H | |
| Analysis Period (min) | 15 | | | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1845 | | 1770 | 1838 | | 1787 | 1693 | | 1770 | 1709 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.57 | 1.00 | | 0.61 | 1.00 | |
| Satd. Flow (perm) | 158 | 1845 | | 158 | 1838 | | 1080 | 1693 | | 1141 | 1709 | |
| Volume (vph) | 80 | 805 | 55 | 90 | 840 | 80 | 55 | 45 | 90 | 230 | 70 | 85 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 85 | 856 | 59 | 96 | 894 | 85 | 59 | 48 | 96 | 245 | 74 | 90 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 73 | 0 | 0 | 49 | 0 |
| Lane Group Flow (vph) | 85 | 912 | 0 | 96 | 975 | 0 | 59 | 71 | 0 | 245 | 115 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 50.6 | 46.1 | | 50.6 | 46.1 | | 19.5 | 19.5 | | 19.5 | 19.5 | |
| Effective Green, g (s) | 52.6 | 47.1 | | 52.6 | 47.1 | | 20.5 | 20.5 | | 20.5 | 20.5 | |
| Actuated g/C Ratio | 0.62 | 0.55 | | 0.62 | 0.55 | | 0.24 | 0.24 | | 0.24 | 0.24 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 202 | 1021 | | 202 | 1017 | | 260 | 408 | | 275 | 412 | |
| v/s Ratio Prot | 0.03 | 0.49 | | c0.03 | c0.53 | | | 0.04 | | | 0.07 | |
| v/s Ratio Perm | 0.23 | | | 0.26 | | | 0.05 | | | c0.21 | | |
| v/c Ratio | 0.42 | 0.89 | | 0.48 | 0.96 | | 0.23 | 0.17 | | 0.89 | 0.28 | |
| Uniform Delay, d1 | 17.3 | 16.8 | | 15.2 | 18.1 | | 25.9 | 25.6 | | 31.2 | 26.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 10.1 | | 0.6 | 18.9 | | 0.4 | 0.2 | | 28.0 | 0.4 | |
| Delay (s) | 17.8 | 26.9 | | 15.8 | 36.9 | | 26.4 | 25.8 | | 59.3 | 26.7 | |
| Level of Service | B | C | | B | D | | C | C | | E | C | |
| Approach Delay (s) | | 26.1 | | | 35.1 | | | 26.0 | | | 46.2 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 32.7 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.90 | | | |
| Actuated Cycle Length (s) | 85.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 88.0% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

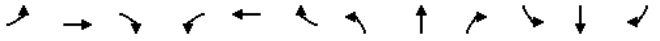




| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 925 | 10 | 30 | 910 | 50 | 10 | 5 | 20 | 55 | 5 | 15 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 10 | 944 | 10 | 31 | 929 | 51 | 10 | 5 | 20 | 56 | 5 | 15 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 980 | | | 954 | | | 1977 | 2010 | 949 | 2003 | 1990 | 954 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 980 | | | 954 | | | 1977 | 2010 | 949 | 2003 | 1990 | 954 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 96 | | | 74 | 91 | 94 | 0 | 91 | 95 |
| cM capacity (veh/h) | 705 | | | 724 | | | 39 | 55 | 315 | 37 | 58 | 316 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 10 | 954 | 31 | 980 | 15 | 20 | 61 | 15 |
| Volume Left | 10 | 0 | 31 | 0 | 10 | 0 | 56 | 0 |
| Volume Right | 0 | 10 | 0 | 51 | 0 | 20 | 0 | 15 |
| cSH | 705 | 1700 | 724 | 1700 | 43 | 315 | 39 | 316 |
| Volume to Capacity | 0.01 | 0.56 | 0.04 | 0.58 | 0.35 | 0.06 | 1.59 | 0.05 |
| Queue Length 95th (ft) | 1 | 0 | 3 | 0 | 30 | 5 | 160 | 4 |
| Control Delay (s) | 10.2 | 0.0 | 10.2 | 0.0 | 127.8 | 17.2 | 519.9 | 17.0 |
| Lane LOS | B | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 0.3 | | 64.6 | | 419.3 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 16.7 | | | |
| Intersection Capacity Utilization | 67.6% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |



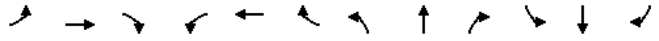
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1766 | | 1805 | 1853 | | 1805 | 1877 | |
| Flt Permitted | | 0.79 | | | 0.88 | | 0.23 | 1.00 | | 0.37 | 1.00 | |
| Satd. Flow (perm) | | 1455 | | | 1566 | | 441 | 1853 | | 696 | 1877 | |
| Volume (vph) | 130 | 100 | 85 | 45 | 100 | 65 | 90 | 355 | 70 | 120 | 515 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 49 | 110 | 71 | 99 | 390 | 77 | 132 | 566 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 29 | 0 | 0 | 13 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 201 | 0 | 99 | 454 | 0 | 132 | 610 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 582 | | | 626 | | 200 | 842 | | 316 | 853 | |
| v/s Ratio Prot | | | | | | | | 0.24 | | | c0.32 | |
| v/s Ratio Perm | | c0.22 | | | 0.13 | | 0.22 | | | 0.19 | | |
| v/c Ratio | | 0.55 | | | 0.32 | | 0.50 | 0.54 | | 0.42 | 0.71 | |
| Uniform Delay, d1 | | 12.7 | | | 11.4 | | 10.6 | 10.8 | | 10.1 | 12.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.8 | | | 1.3 | | 8.5 | 2.5 | | 4.0 | 5.1 | |
| Delay (s) | | 16.5 | | | 12.7 | | 19.1 | 13.3 | | 14.1 | 17.2 | |
| Level of Service | | B | | | B | | B | B | | B | B | |
| Approach Delay (s) | | 16.5 | | | 12.7 | | | 14.3 | | | 16.7 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 15.4 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.64 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 76.9% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1762 | | 1787 | 1689 | | 1805 | 1900 | 1615 | 1787 | 1865 | |
| Flt Permitted | 0.36 | 1.00 | | 0.43 | 1.00 | | 0.49 | 1.00 | 1.00 | 0.43 | 1.00 | |
| Satd. Flow (perm) | 646 | 1762 | | 808 | 1689 | | 936 | 1900 | 1615 | 806 | 1865 | |
| Volume (vph) | 10 | 160 | 20 | 290 | 120 | 255 | 25 | 245 | 215 | 295 | 330 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 22 | 312 | 129 | 274 | 27 | 263 | 231 | 317 | 355 | 22 |
| RTOR Reduction (vph) | 0 | 6 | 0 | 0 | 95 | 0 | 0 | 0 | 151 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 188 | 0 | 312 | 308 | 0 | 27 | 263 | 80 | 317 | 375 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 18.5 | 17.4 | | 29.4 | 23.3 | | 28.4 | 26.2 | 26.2 | 39.2 | 32.0 | |
| Effective Green, g (s) | 20.5 | 18.4 | | 30.4 | 24.3 | | 30.4 | 27.2 | 27.2 | 40.2 | 33.0 | |
| Actuated g/C Ratio | 0.26 | 0.23 | | 0.39 | 0.31 | | 0.39 | 0.35 | 0.35 | 0.51 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 197 | 412 | | 412 | 522 | | 397 | 658 | 559 | 525 | 783 | |
| v/s Ratio Prot | 0.00 | 0.11 | | c0.08 | 0.18 | | 0.00 | 0.14 | | c0.07 | 0.20 | |
| v/s Ratio Perm | 0.01 | | | c0.22 | | | 0.02 | | 0.05 | c0.24 | | |
| v/c Ratio | 0.06 | 0.46 | | 0.76 | 0.59 | | 0.07 | 0.40 | 0.14 | 0.60 | 0.48 | |
| Uniform Delay, d1 | 21.8 | 25.8 | | 19.8 | 22.9 | | 15.0 | 19.5 | 17.7 | 12.1 | 16.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.8 | | 7.8 | 1.8 | | 0.1 | 1.8 | 0.5 | 2.0 | 2.1 | |
| Delay (s) | 21.9 | 26.6 | | 27.5 | 24.7 | | 15.1 | 21.3 | 18.2 | 14.1 | 18.6 | |
| Level of Service | C | C | | C | C | | B | C | B | B | B | |
| Approach Delay (s) | | 26.4 | | | 26.0 | | | 19.6 | | | 16.5 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 21.4 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.65 | | | |
| Actuated Cycle Length (s) | 78.6 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 69.6% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.94 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1781 | | | | | 1860 | 1770 | | | | 1800 | |
| Flt Permitted | 0.95 | | | | | 0.86 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1781 | | | | | 1607 | 1770 | | | | 1800 | |
| Volume (vph) | 155 | 5 | 5 | 5 | 5 | 365 | 425 | 75 | 255 | 5 | 150 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 5 | 5 | 5 | 5 | 397 | 462 | 82 | 277 | 5 | 163 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 178 | 0 | 0 | 0 | 0 | 407 | 803 | 0 | 0 | 0 | 177 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.8 | | | | | 39.3 | 39.3 | | | | 12.7 | |
| Effective Green, g (s) | 13.8 | | | | | 40.3 | 40.3 | | | | 13.7 | |
| Actuated g/C Ratio | 0.17 | | | | | 0.51 | 0.51 | | | | 0.17 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 308 | | | | | 812 | 894 | | | | 309 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.45 | | | | c0.10 | |
| v/s Ratio Perm | | | | | | 0.25 | | | | | | |
| v/c Ratio | 0.58 | | | | | 0.50 | 0.90 | | | | 0.57 | |
| Uniform Delay, d1 | 30.3 | | | | | 13.1 | 17.9 | | | | 30.4 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.6 | | | | | 0.5 | 13.6 | | | | 2.5 | |
| Delay (s) | 32.9 | | | | | 13.6 | 31.5 | | | | 32.9 | |
| Level of Service | C | | | | | B | C | | | | C | |
| Approach Delay (s) | 32.9 | | | | | 13.6 | 31.5 | | | | 32.9 | |
| Approach LOS | C | | | | | B | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 27.2 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.77 | | | |
| Actuated Cycle Length (s) | 79.8 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 70.9% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 10 | 10 | 10 | 230 | 205 | 5 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 11 | 11 | 242 | 216 | 5 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 482 | 218 | 221 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 482 | 218 | 221 | | | |
| tC, single (s) | 6.5 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.6 | 3.4 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 532 | 811 | 1348 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 21 | 253 | 221 |
| Volume Left | 11 | 11 | 0 |
| Volume Right | 11 | 0 | 5 |
| cSH | 643 | 1348 | 1700 |
| Volume to Capacity | 0.03 | 0.01 | 0.13 |
| Queue Length 95th (ft) | 3 | 1 | 0 |
| Control Delay (s) | 10.8 | 0.4 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 10.8 | 0.4 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 30.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

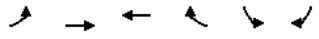
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 180 | 55 | 40 | 150 | 55 | 40 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 191 | 59 | 43 | 160 | 59 | 43 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 202 | 43 | | | 43 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 202 | 43 | | | 43 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 75 | 94 | | | 96 | |
| cM capacity (veh/h) | 759 | 1031 | | | 1560 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 191 | 59 | 43 | 160 | 101 |
| Volume Left | 191 | 0 | 0 | 0 | 59 |
| Volume Right | 0 | 59 | 0 | 160 | 0 |
| cSH | 759 | 1031 | 1700 | 1700 | 1560 |
| Volume to Capacity | 0.25 | 0.06 | 0.03 | 0.09 | 0.04 |
| Queue Length 95th (ft) | 25 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 11.3 | 8.7 | 0.0 | 0.0 | 4.4 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 10.7 | | 0.0 | | 4.4 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.6 | | |
| Intersection Capacity Utilization | 28.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 50 | 10 | 5 | 5 | 45 | 45 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 57 | 11 | 6 | 6 | 52 | 52 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 135 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 135 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 94 | 95 |
| cM capacity (veh/h) | 1595 | | | | 832 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 69 | 11 | 103 |
| Volume Left | 57 | 0 | 52 |
| Volume Right | 0 | 6 | 52 |
| cSH | 1595 | 1700 | 940 |
| Volume to Capacity | 0.04 | 0.01 | 0.11 |
| Queue Length 95th (ft) | 3 | 0 | 9 |
| Control Delay (s) | 6.2 | 0.0 | 9.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.2 | 0.0 | 9.3 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.5 | | |
| Intersection Capacity Utilization | 21.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 230 | 5 | 5 | 205 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 250 | 5 | 5 | 223 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 486 | 253 | | | 255 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 486 | 253 | | | 255 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 538 | 786 | | | 1310 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 255 | 228 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 639 | 1700 | 1310 |
| Volume to Capacity | 0.02 | 0.15 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 10.7 | 0.0 | 0.2 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.7 | 0.0 | 0.2 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 24.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1A
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 717 | 145 | 0 | 0 | 276 | 35 | 138 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 874 | 177 | 0 | 0 | 337 | 43 | 168 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 177 | | | 2284 | 2305 | 177 | 2290 | 2284 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 177 | | | 2284 | 2305 | 177 | 2290 | 2284 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 25 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1393 | | | 11 | 10 | 861 | 11 | 10 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 874 | 177 | 379 | 168 | 6 |
| Volume Left | 874 | 0 | 0 | 168 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 11 | 861 |
| Volume to Capacity | 0.75 | 0.10 | 0.22 | 15.77 | 0.01 |
| Queue Length 95th (ft) | 186 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.6 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.8 | | 0.0 | 9649.7 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1057.6 | | | |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1A
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 797 | 148 | 10 | 404 | 0 | 0 | 0 | 0 | 20 | 0 | 593 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 906 | 168 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 0 | 674 |
| RTOR Reduction (vph) | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 906 | 56 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 319 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.4 | 7.0 | 1.2 | 30.6 | | | | | 15.8 | 15.8 | |
| Effective Green, g (s) | | 37.4 | 8.0 | 2.2 | 31.6 | | | | | 16.8 | 16.8 | |
| Actuated g/C Ratio | | 0.55 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 999 | 182 | 57 | 861 | | | | | 418 | 374 | |
| v/s Ratio Prot | | c0.50 | | 0.01 | 0.25 | | | | | | c0.21 | |
| v/s Ratio Perm | | | c0.04 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.91 | 0.31 | 0.19 | 0.53 | | | | | 0.06 | 0.85 | |
| Uniform Delay, d1 | | 13.9 | 27.7 | 32.2 | 13.1 | | | | | 19.7 | 24.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 11.6 | 1.0 | 1.7 | 0.6 | | | | | 0.1 | 16.8 | |
| Delay (s) | | 25.5 | 28.6 | 33.9 | 13.8 | | | | | 19.8 | 41.4 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 26.0 | | | 14.2 | | | 0.0 | | | 40.7 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 28.1 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.88 | | | |
| Actuated Cycle Length (s) | 68.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project AM Peak - Alt 1A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1798 | | 1719 | 1770 | | 1703 | 1607 | | 1770 | 1751 | |
| Flt Permitted | 0.09 | 1.00 | | 0.19 | 1.00 | | 0.71 | 1.00 | | 0.47 | 1.00 | |
| Satd. Flow (perm) | 171 | 1798 | | 352 | 1770 | | 1269 | 1607 | | 876 | 1751 | |
| Volume (vph) | 57 | 654 | 30 | 72 | 700 | 120 | 40 | 56 | 126 | 140 | 40 | 26 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 65 | 743 | 34 | 82 | 795 | 136 | 45 | 64 | 143 | 159 | 45 | 30 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 92 | 0 | 0 | 24 | 0 |
| Lane Group Flow (vph) | 65 | 775 | 0 | 82 | 925 | 0 | 45 | 115 | 0 | 159 | 51 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.0 | 47.5 | | 52.0 | 47.5 | | 17.2 | 17.2 | | 17.2 | 17.2 | |
| Effective Green, g (s) | 54.0 | 48.5 | | 54.0 | 48.5 | | 18.2 | 18.2 | | 18.2 | 18.2 | |
| Actuated g/C Ratio | 0.64 | 0.58 | | 0.64 | 0.58 | | 0.22 | 0.22 | | 0.22 | 0.22 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 211 | 1036 | | 315 | 1020 | | 274 | 347 | | 189 | 378 | |
| v/s Ratio Prot | c0.02 | 0.43 | | 0.02 | c0.52 | | | 0.07 | | | 0.03 | |
| v/s Ratio Perm | 0.18 | | | 0.15 | | | 0.04 | | | c0.18 | | |
| v/c Ratio | 0.31 | 0.75 | | 0.26 | 0.91 | | 0.16 | 0.33 | | 0.84 | 0.14 | |
| Uniform Delay, d1 | 13.5 | 13.3 | | 9.3 | 15.8 | | 26.8 | 27.9 | | 31.6 | 26.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 3.0 | | 0.2 | 11.3 | | 0.3 | 0.6 | | 27.2 | 0.2 | |
| Delay (s) | 13.8 | 16.3 | | 9.5 | 27.2 | | 27.1 | 28.4 | | 58.8 | 26.8 | |
| Level of Service | B | B | | A | C | | C | C | | E | C | |
| Approach Delay (s) | | 16.1 | | | 25.7 | | | 28.2 | | | 48.6 | |
| Approach LOS | | B | | | C | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 24.8 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.84 | | | |
| Actuated Cycle Length (s) | 84.2 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.9% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project AM Peak - Alt 1A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 13 | 711 | 5 | 15 | 721 | 65 | 5 | 5 | 40 | 35 | 5 | 16 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 14 | 781 | 5 | 16 | 792 | 71 | 5 | 5 | 44 | 38 | 5 | 18 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 864 | | | 787 | | | 1658 | 1709 | 784 | 1718 | 1676 | 828 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 864 | | | 787 | | | 1658 | 1709 | 784 | 1718 | 1676 | 828 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 98 | | | 92 | 94 | 89 | 33 | 94 | 95 |
| cM capacity (veh/h) | 766 | | | 824 | | | 68 | 87 | 392 | 58 | 91 | 369 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 14 | 787 | 16 | 864 | 11 | 44 | 44 | 18 |
| Volume Left | 14 | 0 | 16 | 0 | 5 | 0 | 38 | 0 |
| Volume Right | 0 | 5 | 0 | 71 | 0 | 44 | 0 | 18 |
| cSH | 766 | 1700 | 824 | 1700 | 76 | 392 | 60 | 369 |
| Volume to Capacity | 0.02 | 0.46 | 0.02 | 0.51 | 0.14 | 0.11 | 0.73 | 0.05 |
| Queue Length 95th (ft) | 1 | 0 | 2 | 0 | 12 | 9 | 79 | 4 |
| Control Delay (s) | 9.8 | 0.0 | 9.5 | 0.0 | 59.8 | 15.4 | 155.8 | 15.2 |
| Lane LOS | A | | A | | F | C | F | C |
| Approach Delay (s) | 0.2 | | 0.2 | | 24.3 | | 115.6 | |
| Approach LOS | | | | | C | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.9 | | | |
| Intersection Capacity Utilization | 58.6% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

2022 With Project AM Peak - Alt 1A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.95 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1724 | | 1736 | 1787 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.92 | | 0.54 | 1.00 | | 0.27 | 1.00 | |
| Satd. Flow (perm) | | 1506 | | | 1608 | | 995 | 1787 | | 468 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 34 | 55 | 60 | 70 | 437 | 75 | 30 | 240 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 37 | 59 | 65 | 75 | 470 | 81 | 32 | 258 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 12 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 123 | 0 | 75 | 539 | 0 | 32 | 277 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 633 | | | 675 | | 418 | 751 | | 197 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.30 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.08 | | 0.08 | | | 0.07 | | |
| v/c Ratio | | 0.19 | | | 0.18 | | 0.18 | 0.72 | | 0.16 | 0.38 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 12.0 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.6 | | 0.9 | 5.8 | | 1.8 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.7 | | 10.0 | 17.9 | | 10.8 | 11.5 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.7 | | | 16.9 | | | 11.5 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.45 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 55.5% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

2022 With Project AM Peak - Alt 1A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1590 | | 1687 | 1634 | | 1770 | 1863 | 1583 | 1687 | 1761 | |
| Flt Permitted | 0.55 | 1.00 | | 0.52 | 1.00 | | 0.63 | 1.00 | 1.00 | 0.29 | 1.00 | |
| Satd. Flow (perm) | 895 | 1590 | | 928 | 1634 | | 1176 | 1863 | 1583 | 507 | 1761 | |
| Volume (vph) | 10 | 80 | 20 | 318 | 150 | 170 | 39 | 387 | 447 | 145 | 164 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 22 | 357 | 169 | 191 | 44 | 435 | 502 | 163 | 184 | 11 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 53 | 0 | 0 | 0 | 322 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 11 | 100 | 0 | 357 | 307 | 0 | 44 | 435 | 180 | 163 | 193 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.9 | 11.9 | | 26.8 | 20.8 | | 27.4 | 24.2 | 24.2 | 29.8 | 25.4 | |
| Effective Green, g (s) | 14.9 | 12.9 | | 27.8 | 21.8 | | 29.4 | 25.2 | 25.2 | 31.8 | 26.4 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.45 | 0.37 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 208 | 291 | | 484 | 506 | | 527 | 667 | 567 | 320 | 660 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.11 | 0.19 | | 0.00 | c0.23 | | c0.04 | 0.11 | |
| v/s Ratio Perm | 0.01 | | | c0.18 | | | 0.03 | | 0.11 | 0.19 | | |
| v/c Ratio | 0.05 | 0.34 | | 0.74 | 0.61 | | 0.08 | 0.65 | 0.32 | 0.51 | 0.29 | |
| Uniform Delay, d1 | 22.0 | 25.1 | | 16.7 | 20.7 | | 12.2 | 18.9 | 16.4 | 12.9 | 15.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 5.8 | 2.1 | | 0.1 | 4.9 | 1.5 | 1.3 | 1.1 | |
| Delay (s) | 22.1 | 25.8 | | 22.5 | 22.7 | | 12.3 | 23.8 | 17.8 | 14.2 | 16.6 | |
| Level of Service | C | C | | C | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.4 | | | 22.6 | | | 20.2 | | | 15.5 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 20.5 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.67 | | | |
| Actuated Cycle Length (s) | 70.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 62.7% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1A
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.92 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1782 | | | | | 1808 | 1643 | | | | 1604 | |
| Flt Permitted | 0.95 | | | | | 0.85 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1782 | | | | | 1544 | 1643 | | | | 1604 | |
| Volume (vph) | 205 | 8 | 5 | 5 | 8 | 493 | 172 | 65 | 245 | 5 | 215 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 10 | 6 | 6 | 10 | 640 | 223 | 84 | 258 | 5 | 226 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 282 | 0 | 0 | 0 | 0 | 656 | 527 | 0 | 0 | 0 | 247 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 14.5 | | | | | 24.3 | 24.3 | | | | 14.3 | |
| Effective Green, g (s) | 15.5 | | | | | 25.3 | 25.3 | | | | 15.3 | |
| Actuated g/C Ratio | 0.23 | | | | | 0.37 | 0.37 | | | | 0.22 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 406 | | | | | 574 | 610 | | | | 360 | |
| v/s Ratio Prot | c0.16 | | | | | | 0.32 | | | | c0.15 | |
| v/s Ratio Perm | | | | | | c0.42 | | | | | | |
| v/c Ratio | 0.69 | | | | | 1.14 | 0.86 | | | | 0.69 | |
| Uniform Delay, d1 | 24.1 | | | | | 21.4 | 19.8 | | | | 24.2 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 5.1 | | | | | 83.6 | 15.0 | | | | 5.4 | |
| Delay (s) | 29.2 | | | | | 105.0 | 34.8 | | | | 29.6 | |
| Level of Service | C | | | | | F | C | | | | C | |
| Approach Delay (s) | 29.2 | | | | | 105.0 | 34.8 | | | | 29.6 | |
| Approach LOS | C | | | | | F | C | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 59.4 | HCM Level of Service | E |
| HCM Volume to Capacity ratio | 0.90 | | |
| Actuated Cycle Length (s) | 68.1 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 72.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1A
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 35 | 0 | 237 | 5 | 150 | 9 | 60 | 90 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 38 | 0 | 258 | 6 | 192 | 10 | 65 | 115 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 712 | 464 | 119 | 462 | 462 | 197 | 122 | | | 202 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 712 | 464 | 119 | 462 | 462 | 197 | 122 | | | 202 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 97 | 100 | 99 | 92 | 100 | 69 | 100 | | | 95 | | |
| cM capacity (veh/h) | 234 | 470 | 939 | 486 | 471 | 844 | 1441 | | | 1370 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 38 | 258 | 6 | 202 | 65 | 122 |
| Volume Left | 6 | 38 | 0 | 6 | 0 | 65 | 0 |
| Volume Right | 6 | 0 | 258 | 0 | 10 | 0 | 6 |
| cSH | 374 | 486 | 844 | 1441 | 1700 | 1370 | 1700 |
| Volume to Capacity | 0.03 | 0.08 | 0.31 | 0.00 | 0.12 | 0.05 | 0.07 |
| Queue Length 95th (ft) | 3 | 6 | 32 | 0 | 0 | 4 | 0 |
| Control Delay (s) | 15.0 | 13.0 | 11.1 | 7.5 | 0.0 | 7.8 | 0.0 |
| Lane LOS | B | B | B | A | | A | |
| Approach Delay (s) | 15.0 | 11.4 | | 0.2 | | 2.7 | |
| Approach LOS | B | B | | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.8 | | |
| Intersection Capacity Utilization | 36.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

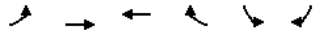
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 115 | 62 | 27 | 70 | 52 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 125 | 67 | 29 | 76 | 57 | 36 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 178 | 29 | | | 29 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 178 | 29 | | | 29 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 84 | 93 | | | 96 | |
| cM capacity (veh/h) | 775 | 1037 | | | 1533 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 125 | 67 | 29 | 76 | 92 |
| Volume Left | 125 | 0 | 0 | 0 | 57 |
| Volume Right | 0 | 67 | 0 | 76 | 0 |
| cSH | 775 | 1037 | 1700 | 1700 | 1533 |
| Volume to Capacity | 0.16 | 0.07 | 0.02 | 0.04 | 0.04 |
| Queue Length 95th (ft) | 14 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 10.5 | 8.7 | 0.0 | 0.0 | 4.7 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.9 | | 0.0 | | 4.7 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.0 | | |
| Intersection Capacity Utilization | 24.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 82 | 5 | 5 | 35 | 5 | 32 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 98 | 6 | 6 | 42 | 6 | 38 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 228 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 228 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 94 | | | | 99 | 96 |
| cM capacity (veh/h) | 1573 | | | | 701 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 104 | 48 | 44 |
| Volume Left | 98 | 0 | 6 |
| Volume Right | 0 | 42 | 38 |
| cSH | 1573 | 1700 | 970 |
| Volume to Capacity | 0.06 | 0.03 | 0.05 |
| Queue Length 95th (ft) | 5 | 0 | 4 |
| Control Delay (s) | 7.0 | 0.0 | 8.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 7.0 | 0.0 | 8.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.7 | | |
| Intersection Capacity Utilization | 21.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 392 | 5 | 5 | 150 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 426 | 5 | 5 | 163 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 603 | 429 | | | 432 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 603 | 429 | | | 432 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 460 | 626 | | | 1128 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 432 | 168 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 530 | 1700 | 1128 |
| Volume to Capacity | 0.02 | 0.25 | 0.00 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 11.9 | 0.0 | 0.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.9 | 0.0 | 0.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 30.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1A
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 856 | 343 | 0 | 0 | 231 | 55 | 219 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 920 | 369 | 0 | 0 | 248 | 59 | 235 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 308 | | | 369 | | | 2488 | 2517 | 369 | 2509 | 2488 | 278 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 308 | | | 369 | | | 2488 | 2517 | 369 | 2509 | 2488 | 278 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1253 | | | 1195 | | | 8 | 7 | 677 | 8 | 8 | 766 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 920 | 369 | 308 | 235 | 22 |
| Volume Left | 920 | 0 | 0 | 235 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1253 | 1700 | 1700 | 8 | 677 |
| Volume to Capacity | 0.73 | 0.22 | 0.18 | 29.54 | 0.03 |
| Queue Length 95th (ft) | 177 | 0 | 0 | Err | 2 |
| Control Delay (s) | 15.4 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | C | | | F | B |
| Approach Delay (s) | 11.0 | | 0.0 | 9163.1 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1277.9 | | | |
| Intersection Capacity Utilization | 138.2% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1A
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.16 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 308 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1024 | 197 | 20 | 400 | 0 | 0 | 0 | 0 | 80 | 0 | 875 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1056 | 203 | 21 | 412 | 0 | 0 | 0 | 0 | 82 | 0 | 902 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1056 | 68 | 21 | 412 | 0 | 0 | 0 | 0 | 82 | 465 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | | Perm | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 37.0 | 8.6 | 23.4 | 23.4 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 38.0 | 9.6 | 24.4 | 24.4 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1106 | 237 | 117 | 717 | | | | | 498 | 445 | |
| v/s Ratio Prot | | c0.57 | 0.04 | | 0.22 | | | | | | c0.29 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.29 | 0.18 | 0.57 | | | | | 0.16 | 1.04 | |
| Uniform Delay, d1 | | 12.2 | 24.2 | 13.2 | 15.7 | | | | | 17.3 | 23.0 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 17.2 | 0.7 | 0.7 | 1.1 | | | | | 0.2 | 54.9 | |
| Delay (s) | | 29.3 | 24.8 | 13.9 | 16.8 | | | | | 17.5 | 77.9 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 28.6 | | | 16.7 | | | 0.0 | | | 72.8 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 42.9 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.98 | | | |
| Actuated Cycle Length (s) | 64.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 138.2% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project PM Peak, Alt 1A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1846 | | 1770 | 1841 | | 1787 | 1685 | | 1770 | 1706 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.58 | 1.00 | |
| Satd. Flow (perm) | 151 | 1846 | | 151 | 1841 | | 1059 | 1685 | | 1077 | 1706 | |
| Volume (vph) | 80 | 852 | 55 | 118 | 927 | 80 | 55 | 46 | 104 | 230 | 70 | 88 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 85 | 906 | 59 | 126 | 986 | 85 | 59 | 49 | 111 | 245 | 74 | 94 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 84 | 0 | 0 | 51 | 0 |
| Lane Group Flow (vph) | 85 | 962 | 0 | 126 | 1067 | 0 | 59 | 76 | 0 | 245 | 117 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.9 | 48.2 | | 52.9 | 48.2 | | 20.4 | 20.4 | | 20.4 | 20.4 | |
| Effective Green, g (s) | 54.9 | 49.2 | | 54.9 | 49.2 | | 21.4 | 21.4 | | 21.4 | 21.4 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.62 | 0.56 | | 0.24 | 0.24 | | 0.24 | 0.24 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 1029 | | 198 | 1026 | | 257 | 408 | | 261 | 413 | |
| v/s Ratio Prot | 0.03 | 0.52 | | c0.04 | c0.58 | | | 0.05 | | | 0.07 | |
| v/s Ratio Perm | 0.24 | | | 0.35 | | | 0.06 | | | c0.23 | | |
| v/c Ratio | 0.43 | 0.94 | | 0.64 | 1.04 | | 0.23 | 0.19 | | 0.94 | 0.28 | |
| Uniform Delay, d1 | 20.3 | 18.1 | | 17.9 | 19.5 | | 26.8 | 26.5 | | 32.8 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 14.9 | | 4.9 | 39.2 | | 0.5 | 0.2 | | 38.9 | 0.4 | |
| Delay (s) | 20.9 | 32.9 | | 22.8 | 58.7 | | 27.3 | 26.8 | | 71.7 | 27.6 | |
| Level of Service | C | C | | C | E | | C | C | | E | C | |
| Approach Delay (s) | | 32.0 | | | 54.9 | | | 26.9 | | | 53.8 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 44.3 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.98 | | | |
| Actuated Cycle Length (s) | 88.3 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 93.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project PM Peak, Alt 1A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 972 | 10 | 30 | 1000 | 50 | 10 | 5 | 20 | 55 | 5 | 18 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 11 | 992 | 10 | 31 | 1020 | 51 | 10 | 5 | 20 | 56 | 5 | 18 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1071 | | | 1002 | | | 2122 | 2152 | 997 | 2144 | 2132 | 1046 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1071 | | | 1002 | | | 2122 | 2152 | 997 | 2144 | 2132 | 1046 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 96 | | | 66 | 89 | 93 | 0 | 89 | 93 |
| cM capacity (veh/h) | 651 | | | 695 | | | 30 | 45 | 295 | 29 | 47 | 280 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 1002 | 31 | 1071 | 15 | 20 | 61 | 18 |
| Volume Left | 11 | 0 | 31 | 0 | 10 | 0 | 56 | 0 |
| Volume Right | 0 | 10 | 0 | 51 | 0 | 20 | 0 | 18 |
| cSH | 651 | 1700 | 695 | 1700 | 33 | 295 | 30 | 280 |
| Volume to Capacity | 0.02 | 0.59 | 0.04 | 0.63 | 0.46 | 0.07 | 2.05 | 0.07 |
| Queue Length 95th (ft) | 1 | 0 | 3 | 0 | 38 | 6 | 178 | 5 |
| Control Delay (s) | 10.6 | 0.0 | 10.4 | 0.0 | 183.2 | 18.1 | 769.7 | 18.8 |
| Lane LOS | B | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 0.3 | | 88.9 | | 596.4 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 22.9 | | | |
| Intersection Capacity Utilization | 72.3% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1A
5: Harris Ave & 12th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1848 | | 1805 | 1880 | |
| Flt Permitted | | 0.77 | | | 0.82 | | 0.16 | 1.00 | | 0.30 | 1.00 | |
| Satd. Flow (perm) | | 1415 | | | 1465 | | 304 | 1848 | | 571 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 81 | 100 | 65 | 90 | 400 | 89 | 120 | 599 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 89 | 110 | 71 | 99 | 440 | 98 | 132 | 658 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 23 | 0 | 0 | 15 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 247 | 0 | 99 | 523 | 0 | 132 | 702 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 566 | | | 586 | | 138 | 840 | | 260 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.28 | | | c0.37 | |
| v/s Ratio Perm | | c0.23 | | | 0.17 | | 0.33 | | | 0.23 | | |
| v/c Ratio | | 0.57 | | | 0.42 | | 0.72 | 0.62 | | 0.51 | 0.82 | |
| Uniform Delay, d1 | | 12.8 | | | 11.9 | | 12.1 | 11.4 | | 10.6 | 13.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.1 | | | 2.2 | | 27.3 | 3.5 | | 6.9 | 8.7 | |
| Delay (s) | | 16.9 | | | 14.1 | | 39.4 | 14.9 | | 17.6 | 21.8 | |
| Level of Service | | B | | | B | | D | B | | B | C | |
| Approach Delay (s) | | 16.9 | | | 14.1 | | | 18.7 | | | 21.1 | |
| Approach LOS | | B | | | B | | | B | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 18.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.70 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 74.7% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1A
6: Old Fairhaven Pkwy & 12th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1739 | | 1787 | 1689 | | 1805 | 1900 | 1615 | 1787 | 1869 | |
| Flt Permitted | 0.37 | 1.00 | | 0.40 | 1.00 | | 0.30 | 1.00 | 1.00 | 0.34 | 1.00 | |
| Satd. Flow (perm) | 667 | 1739 | | 761 | 1689 | | 561 | 1900 | 1615 | 646 | 1869 | |
| Volume (vph) | 10 | 160 | 40 | 385 | 120 | 255 | 35 | 309 | 266 | 295 | 450 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 43 | 414 | 129 | 274 | 38 | 332 | 286 | 317 | 484 | 22 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 94 | 0 | 0 | 0 | 190 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 203 | 0 | 414 | 309 | 0 | 38 | 332 | 96 | 317 | 504 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 19.0 | 17.9 | | 29.9 | 23.8 | | 28.8 | 25.3 | 25.3 | 37.8 | 29.8 | |
| Effective Green, g (s) | 21.0 | 18.9 | | 30.9 | 24.8 | | 30.8 | 26.3 | 26.3 | 39.3 | 30.8 | |
| Actuated g/C Ratio | 0.27 | 0.24 | | 0.40 | 0.32 | | 0.39 | 0.34 | 0.34 | 0.50 | 0.39 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 207 | 420 | | 406 | 536 | | 293 | 639 | 543 | 456 | 736 | |
| v/s Ratio Prot | 0.00 | 0.12 | | c0.10 | 0.18 | | 0.01 | 0.17 | | c0.08 | 0.27 | |
| v/s Ratio Perm | 0.01 | | | c0.30 | | | 0.04 | | 0.06 | c0.27 | | |
| v/c Ratio | 0.05 | 0.48 | | 1.02 | 0.58 | | 0.13 | 0.52 | 0.18 | 0.70 | 0.69 | |
| Uniform Delay, d1 | 21.3 | 25.5 | | 22.9 | 22.3 | | 15.3 | 20.9 | 18.3 | 13.0 | 19.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 49.8 | 1.5 | | 0.2 | 3.0 | 0.7 | 4.6 | 5.1 | |
| Delay (s) | 21.4 | 26.3 | | 72.7 | 23.8 | | 15.5 | 23.9 | 19.0 | 17.6 | 24.8 | |
| Level of Service | C | C | | E | C | | B | C | B | B | C | |
| Approach Delay (s) | | 26.1 | | | 48.6 | | | 21.3 | | | 22.0 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 30.8 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.82 | | | |
| Actuated Cycle Length (s) | 78.2 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 78.1% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1A
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.95 | | | | 0.99 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1780 | | | | | 1861 | 1796 | | | | 1800 | |
| Flt Permitted | 0.96 | | | | | 0.57 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1780 | | | | | 1065 | 1796 | | | | 1800 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 490 | 660 | 75 | 255 | 5 | 150 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 533 | 717 | 82 | 277 | 5 | 163 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 180 | 0 | 0 | 0 | 0 | 545 | 1064 | 0 | 0 | 0 | 177 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.9 | | | | | 39.3 | 39.3 | | | | 12.7 | |
| Effective Green, g (s) | 13.9 | | | | | 40.3 | 40.3 | | | | 13.7 | |
| Actuated g/C Ratio | 0.17 | | | | | 0.50 | 0.50 | | | | 0.17 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 310 | | | | | 537 | 906 | | | | 309 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.59 | | | | c0.10 | |
| v/s Ratio Perm | | | | | | 0.51 | | | | | | |
| v/c Ratio | 0.58 | | | | | 1.01 | 1.17 | | | | 0.57 | |
| Uniform Delay, d1 | 30.3 | | | | | 19.8 | 19.8 | | | | 30.4 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.8 | | | | | 42.6 | 90.0 | | | | 2.5 | |
| Delay (s) | 33.1 | | | | | 62.4 | 109.8 | | | | 32.9 | |
| Level of Service | C | | | | | E | F | | | | C | |
| Approach Delay (s) | 33.1 | | | | | 62.4 | 109.8 | | | | 32.9 | |
| Approach LOS | C | | | | | E | F | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 82.8 | HCM Level of Service | F | |
| HCM Volume to Capacity ratio | 0.93 | | | |
| Actuated Cycle Length (s) | 79.9 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 83.3% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1A
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 19 | 0 | 130 | 10 | 230 | 36 | 244 | 205 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 21 | 0 | 141 | 11 | 242 | 39 | 265 | 216 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1153 | 1051 | 218 | 1039 | 1034 | 262 | 221 | | | 281 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1153 | 1051 | 218 | 1039 | 1034 | 262 | 221 | | | 281 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 91 | 100 | 99 | 88 | 100 | 82 | 99 | | | 79 | | |
| cM capacity (veh/h) | 117 | 178 | 811 | 172 | 183 | 777 | 1348 | | | 1281 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 21 | 21 | 141 | 11 | 281 | 265 | 221 |
| Volume Left | 11 | 21 | 0 | 11 | 0 | 265 | 0 |
| Volume Right | 11 | 0 | 141 | 0 | 39 | 0 | 5 |
| cSH | 205 | 172 | 777 | 1348 | 1700 | 1281 | 1700 |
| Volume to Capacity | 0.10 | 0.12 | 0.18 | 0.01 | 0.17 | 0.21 | 0.13 |
| Queue Length 95th (ft) | 8 | 10 | 17 | 1 | 0 | 19 | 0 |
| Control Delay (s) | 24.6 | 28.8 | 10.7 | 7.7 | 0.0 | 8.5 | 0.0 |
| Lane LOS | C | D | B | A | | A | |
| Approach Delay (s) | 24.6 | 13.0 | | 0.3 | | 4.7 | |
| Approach LOS | C | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.2 | | | |
| Intersection Capacity Utilization | 48.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

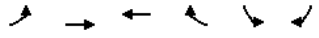
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 180 | 83 | 48 | 150 | 70 | 44 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 191 | 88 | 51 | 160 | 74 | 47 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 247 | 51 | | | 51 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 247 | 51 | | | 51 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 73 | 91 | | | 95 | |
| cM capacity (veh/h) | 708 | 1020 | | | 1549 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 191 | 88 | 51 | 160 | 121 |
| Volume Left | 191 | 0 | 0 | 0 | 74 |
| Volume Right | 0 | 88 | 0 | 160 | 0 |
| cSH | 708 | 1020 | 1700 | 1700 | 1549 |
| Volume to Capacity | 0.27 | 0.09 | 0.03 | 0.09 | 0.05 |
| Queue Length 95th (ft) | 27 | 7 | 0 | 0 | 4 |
| Control Delay (s) | 12.0 | 8.9 | 0.0 | 0.0 | 4.7 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 11.0 | | 0.0 | | 4.7 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.0 | | |
| Intersection Capacity Utilization | 29.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 65 | 10 | 5 | 5 | 45 | 73 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 75 | 11 | 6 | 6 | 52 | 84 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 170 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 170 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 95 | | | | 93 | 92 |
| cM capacity (veh/h) | 1595 | | | | 787 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 86 | 11 | 136 |
| Volume Left | 75 | 0 | 52 |
| Volume Right | 0 | 6 | 84 |
| cSH | 1595 | 1700 | 945 |
| Volume to Capacity | 0.05 | 0.01 | 0.14 |
| Queue Length 95th (ft) | 4 | 0 | 13 |
| Control Delay (s) | 6.4 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.4 | 0.0 | 9.4 |
| Approach LOS | | | A |

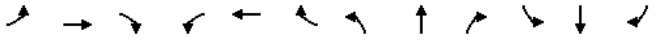
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.9 | | |
| Intersection Capacity Utilization | 24.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 360 | 5 | 5 | 449 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 391 | 5 | 5 | 488 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 893 | 394 | | | 397 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 893 | 394 | | | 397 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 99 | | | 100 | |
| cM capacity (veh/h) | 311 | 655 | | | 1162 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 397 | 493 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 421 | 1700 | 1162 |
| Volume to Capacity | 0.03 | 0.23 | 0.00 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 13.8 | 0.0 | 0.1 |
| Lane LOS | B | | A |
| Approach Delay (s) | 13.8 | 0.0 | 0.1 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 37.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1B
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009



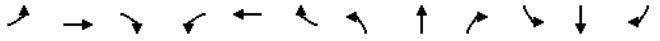
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 717 | 145 | 0 | 0 | 276 | 35 | 138 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 874 | 177 | 0 | 0 | 337 | 43 | 168 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 177 | | | 2284 | 2305 | 177 | 2290 | 2284 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 177 | | | 2284 | 2305 | 177 | 2290 | 2284 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 25 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1393 | | | 11 | 10 | 861 | 11 | 10 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 874 | 177 | 379 | 168 | 6 |
| Volume Left | 874 | 0 | 0 | 168 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 11 | 861 |
| Volume to Capacity | 0.75 | 0.10 | 0.22 | 15.77 | 0.01 |
| Queue Length 95th (ft) | 186 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.6 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.8 | | 0.0 | 9649.7 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1057.6 | | | |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1B
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 797 | 148 | 10 | 404 | 0 | 0 | 0 | 0 | 20 | 0 | 593 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 906 | 168 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 0 | 674 |
| RTOR Reduction (vph) | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 906 | 56 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 319 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.4 | 7.0 | 1.2 | 30.6 | | | | | 15.8 | 15.8 | |
| Effective Green, g (s) | | 37.4 | 8.0 | 2.2 | 31.6 | | | | | 16.8 | 16.8 | |
| Actuated g/C Ratio | | 0.55 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 999 | 182 | 57 | 861 | | | | | 418 | 374 | |
| v/s Ratio Prot | | c0.50 | | 0.01 | 0.25 | | | | | | c0.21 | |
| v/s Ratio Perm | | | c0.04 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.91 | 0.31 | 0.19 | 0.53 | | | | | 0.06 | 0.85 | |
| Uniform Delay, d1 | | 13.9 | 27.7 | 32.2 | 13.1 | | | | | 19.7 | 24.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 11.6 | 1.0 | 1.7 | 0.6 | | | | | 0.1 | 16.8 | |
| Delay (s) | | 25.5 | 28.6 | 33.9 | 13.8 | | | | | 19.8 | 41.4 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 26.0 | | | 14.2 | | | 0.0 | | | 40.7 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 28.1 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.88 | | | |
| Actuated Cycle Length (s) | 68.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project AM Peak - Alt 1B
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1798 | | 1719 | 1770 | | 1703 | 1607 | | 1770 | 1751 | |
| Flt Permitted | 0.09 | 1.00 | | 0.19 | 1.00 | | 0.71 | 1.00 | | 0.47 | 1.00 | |
| Satd. Flow (perm) | 171 | 1798 | | 352 | 1770 | | 1269 | 1607 | | 876 | 1751 | |
| Volume (vph) | 57 | 654 | 30 | 72 | 700 | 120 | 40 | 56 | 126 | 140 | 40 | 26 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 65 | 743 | 34 | 82 | 795 | 136 | 45 | 64 | 143 | 159 | 45 | 30 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 92 | 0 | 0 | 24 | 0 |
| Lane Group Flow (vph) | 65 | 775 | 0 | 82 | 925 | 0 | 45 | 115 | 0 | 159 | 51 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.0 | 47.5 | | 52.0 | 47.5 | | 17.2 | 17.2 | | 17.2 | 17.2 | |
| Effective Green, g (s) | 54.0 | 48.5 | | 54.0 | 48.5 | | 18.2 | 18.2 | | 18.2 | 18.2 | |
| Actuated g/C Ratio | 0.64 | 0.58 | | 0.64 | 0.58 | | 0.22 | 0.22 | | 0.22 | 0.22 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 211 | 1036 | | 315 | 1020 | | 274 | 347 | | 189 | 378 | |
| v/s Ratio Prot | c0.02 | 0.43 | | 0.02 | c0.52 | | | 0.07 | | | 0.03 | |
| v/s Ratio Perm | 0.18 | | | 0.15 | | | 0.04 | | | c0.18 | | |
| v/c Ratio | 0.31 | 0.75 | | 0.26 | 0.91 | | 0.16 | 0.33 | | 0.84 | 0.14 | |
| Uniform Delay, d1 | 13.5 | 13.3 | | 9.3 | 15.8 | | 26.8 | 27.9 | | 31.6 | 26.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 3.0 | | 0.2 | 11.3 | | 0.3 | 0.6 | | 27.2 | 0.2 | |
| Delay (s) | 13.8 | 16.3 | | 9.5 | 27.2 | | 27.1 | 28.4 | | 58.8 | 26.8 | |
| Level of Service | B | B | | A | C | | C | C | | E | C | |
| Approach Delay (s) | | 16.1 | | | 25.7 | | | 28.2 | | | 48.6 | |
| Approach LOS | | B | | | C | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 24.8 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.84 | | | |
| Actuated Cycle Length (s) | 84.2 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.9% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project AM Peak - Alt 1B
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 13 | 711 | 5 | 15 | 721 | 65 | 5 | 5 | 40 | 35 | 5 | 16 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 14 | 781 | 5 | 16 | 792 | 71 | 5 | 5 | 44 | 38 | 5 | 18 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 864 | | | 787 | | | 1658 | 1709 | 784 | 1718 | 1676 | 828 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 864 | | | 787 | | | 1658 | 1709 | 784 | 1718 | 1676 | 828 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 98 | | | 92 | 94 | 89 | 33 | 94 | 95 |
| cM capacity (veh/h) | 766 | | | 824 | | | 68 | 87 | 392 | 58 | 91 | 369 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 14 | 787 | 16 | 864 | 11 | 44 | 44 | 18 |
| Volume Left | 14 | 0 | 16 | 0 | 5 | 0 | 38 | 0 |
| Volume Right | 0 | 5 | 0 | 71 | 0 | 44 | 0 | 18 |
| cSH | 766 | 1700 | 824 | 1700 | 76 | 392 | 60 | 369 |
| Volume to Capacity | 0.02 | 0.46 | 0.02 | 0.51 | 0.14 | 0.11 | 0.73 | 0.05 |
| Queue Length 95th (ft) | 1 | 0 | 2 | 0 | 12 | 9 | 79 | 4 |
| Control Delay (s) | 9.8 | 0.0 | 9.5 | 0.0 | 59.8 | 15.4 | 155.8 | 15.2 |
| Lane LOS | A | | A | | F | C | F | C |
| Approach Delay (s) | 0.2 | | 0.2 | | 24.3 | | 115.6 | |
| Approach LOS | | | | | C | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.9 | | | |
| Intersection Capacity Utilization | 58.6% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.95 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1724 | | 1736 | 1787 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.92 | | 0.54 | 1.00 | | 0.27 | 1.00 | |
| Satd. Flow (perm) | | 1506 | | | 1608 | | 995 | 1787 | | 468 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 34 | 55 | 60 | 70 | 437 | 75 | 30 | 240 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 37 | 59 | 65 | 75 | 470 | 81 | 32 | 258 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 12 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 123 | 0 | 75 | 539 | 0 | 32 | 277 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 633 | | | 675 | | 418 | 751 | | 197 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.30 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.08 | | 0.08 | | | 0.07 | | |
| v/c Ratio | | 0.19 | | | 0.18 | | 0.18 | 0.72 | | 0.16 | 0.38 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 12.0 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.6 | | 0.9 | 5.8 | | 1.8 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.7 | | 10.0 | 17.9 | | 10.8 | 11.5 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.7 | | | 16.9 | | | 11.5 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.45 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 55.5% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1590 | | 1687 | 1634 | | 1770 | 1863 | 1583 | 1687 | 1761 | |
| Flt Permitted | 0.55 | 1.00 | | 0.52 | 1.00 | | 0.63 | 1.00 | 1.00 | 0.29 | 1.00 | |
| Satd. Flow (perm) | 895 | 1590 | | 928 | 1634 | | 1176 | 1863 | 1583 | 507 | 1761 | |
| Volume (vph) | 10 | 80 | 20 | 318 | 150 | 170 | 39 | 387 | 447 | 145 | 164 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 22 | 357 | 169 | 191 | 44 | 435 | 502 | 163 | 184 | 11 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 53 | 0 | 0 | 0 | 322 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 11 | 100 | 0 | 357 | 307 | 0 | 44 | 435 | 180 | 163 | 193 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.9 | 11.9 | | 26.8 | 20.8 | | 27.4 | 24.2 | 24.2 | 29.8 | 25.4 | |
| Effective Green, g (s) | 14.9 | 12.9 | | 27.8 | 21.8 | | 29.4 | 25.2 | 25.2 | 31.8 | 26.4 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.45 | 0.37 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 208 | 291 | | 484 | 506 | | 527 | 667 | 567 | 320 | 660 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.11 | 0.19 | | 0.00 | c0.23 | | c0.04 | 0.11 | |
| v/s Ratio Perm | 0.01 | | | c0.18 | | | 0.03 | | 0.11 | 0.19 | | |
| v/c Ratio | 0.05 | 0.34 | | 0.74 | 0.61 | | 0.08 | 0.65 | 0.32 | 0.51 | 0.29 | |
| Uniform Delay, d1 | 22.0 | 25.1 | | 16.7 | 20.7 | | 12.2 | 18.9 | 16.4 | 12.9 | 15.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 5.8 | 2.1 | | 0.1 | 4.9 | 1.5 | 1.3 | 1.1 | |
| Delay (s) | 22.1 | 25.8 | | 22.5 | 22.7 | | 12.3 | 23.8 | 17.8 | 14.2 | 16.6 | |
| Level of Service | C | C | | C | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.4 | | | 22.6 | | | 20.2 | | | 15.5 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 20.5 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.67 | | | |
| Actuated Cycle Length (s) | 70.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 62.7% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1B
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | | 4.0 | 4.0 | | 4.0 | | 4.0 | |
| Lane Util. Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Frt | 0.99 | | 0.85 | | | 1.00 | 0.96 | | 0.85 | | 0.99 | |
| Flt Protected | 0.95 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (prot) | 1785 | | 1553 | | | 1808 | 1687 | | 1553 | | 1604 | |
| Flt Permitted | 0.95 | | 1.00 | | | 0.99 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (perm) | 1785 | | 1553 | | | 1790 | 1687 | | 1553 | | 1604 | |
| Volume (vph) | 205 | 8 | 5 | 5 | 8 | 493 | 172 | 65 | 245 | 5 | 215 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 10 | 6 | 6 | 10 | 640 | 223 | 84 | 258 | 5 | 226 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 162 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 276 | 0 | 6 | 0 | 0 | 656 | 307 | 0 | 96 | 0 | 247 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | Perm | Perm | Perm | | | | Perm | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | 7 | 2 | 2 | | | | 6 | | | |
| Actuated Green, G (s) | 14.4 | | 14.4 | | | 24.3 | 24.3 | | 24.3 | | 14.3 | |
| Effective Green, g (s) | 15.4 | | 15.4 | | | 25.3 | 25.3 | | 25.3 | | 15.3 | |
| Actuated g/C Ratio | 0.23 | | 0.23 | | | 0.37 | 0.37 | | 0.37 | | 0.22 | |
| Clearance Time (s) | 5.0 | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | 404 | | 352 | | | 666 | 628 | | 578 | | 361 | |
| v/s Ratio Prot | c0.15 | | | | | | 0.18 | | | | c0.15 | |
| v/s Ratio Perm | | | 0.00 | | | c0.37 | | | 0.06 | | | |
| v/c Ratio | 0.68 | | 0.02 | | | 0.98 | 0.49 | | 0.17 | | 0.69 | |
| Uniform Delay, d1 | 24.1 | | 20.4 | | | 21.2 | 16.4 | | 14.3 | | 24.1 | |
| Progression Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Incremental Delay, d2 | 4.7 | | 0.0 | | | 30.8 | 2.7 | | 0.6 | | 5.3 | |
| Delay (s) | 28.8 | | 20.4 | | | 52.0 | 19.1 | | 14.9 | | 29.5 | |
| Level of Service | C | | C | | | D | B | | B | | C | |
| Approach Delay (s) | 28.6 | | | | | 52.0 | 17.2 | | | | 29.5 | |
| Approach LOS | C | | | | | D | B | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 33.8 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.82 | | | |
| Actuated Cycle Length (s) | 68.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 71.7% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1B
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 35 | 0 | 237 | 5 | 150 | 9 | 60 | 90 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 38 | 0 | 258 | 6 | 192 | 10 | 65 | 115 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 712 | 464 | 119 | 462 | 462 | 197 | 122 | | | 202 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 712 | 464 | 119 | 462 | 462 | 197 | 122 | | | 202 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 97 | 100 | 99 | 92 | 100 | 69 | 100 | | | 95 | | |
| cM capacity (veh/h) | 234 | 470 | 939 | 486 | 471 | 844 | 1441 | | | 1370 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 38 | 258 | 6 | 202 | 65 | 122 |
| Volume Left | 6 | 38 | 0 | 6 | 0 | 65 | 0 |
| Volume Right | 6 | 0 | 258 | 0 | 10 | 0 | 6 |
| cSH | 374 | 486 | 844 | 1441 | 1700 | 1370 | 1700 |
| Volume to Capacity | 0.03 | 0.08 | 0.31 | 0.00 | 0.12 | 0.05 | 0.07 |
| Queue Length 95th (ft) | 3 | 6 | 32 | 0 | 0 | 4 | 0 |
| Control Delay (s) | 15.0 | 13.0 | 11.1 | 7.5 | 0.0 | 7.8 | 0.0 |
| Lane LOS | B | B | B | A | | A | |
| Approach Delay (s) | 15.0 | 11.4 | | 0.2 | | 2.7 | |
| Approach LOS | B | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.8 | | | |
| Intersection Capacity Utilization | 36.4% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

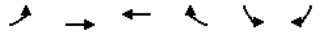
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 115 | 62 | 27 | 70 | 52 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 125 | 67 | 29 | 76 | 57 | 36 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 178 | 29 | | | 29 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 178 | 29 | | | 29 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 84 | 93 | | | 96 | |
| cM capacity (veh/h) | 775 | 1037 | | | 1533 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 125 | 67 | 29 | 76 | 92 |
| Volume Left | 125 | 0 | 0 | 0 | 57 |
| Volume Right | 0 | 67 | 0 | 76 | 0 |
| cSH | 775 | 1037 | 1700 | 1700 | 1533 |
| Volume to Capacity | 0.16 | 0.07 | 0.02 | 0.04 | 0.04 |
| Queue Length 95th (ft) | 14 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 10.5 | 8.7 | 0.0 | 0.0 | 4.7 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.9 | | 0.0 | | 4.7 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.0 | | |
| Intersection Capacity Utilization | 24.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 82 | 5 | 5 | 35 | 5 | 32 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 98 | 6 | 6 | 42 | 6 | 38 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 228 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 228 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 94 | | | | 99 | 96 |
| cM capacity (veh/h) | 1573 | | | | 701 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 104 | 48 | 44 |
| Volume Left | 98 | 0 | 6 |
| Volume Right | 0 | 42 | 38 |
| cSH | 1573 | 1700 | 970 |
| Volume to Capacity | 0.06 | 0.03 | 0.05 |
| Queue Length 95th (ft) | 5 | 0 | 4 |
| Control Delay (s) | 7.0 | 0.0 | 8.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 7.0 | 0.0 | 8.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.7 | | |
| Intersection Capacity Utilization | 21.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 392 | 5 | 5 | 150 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 426 | 5 | 5 | 163 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 603 | 429 | | | 432 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 603 | 429 | | | 432 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 460 | 626 | | | 1128 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 432 | 168 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 530 | 1700 | 1128 |
| Volume to Capacity | 0.02 | 0.25 | 0.00 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 11.9 | 0.0 | 0.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.9 | 0.0 | 0.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 30.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1B
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 856 | 343 | 0 | 0 | 231 | 55 | 219 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 920 | 369 | 0 | 0 | 248 | 59 | 235 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 308 | | | 369 | | | 2488 | 2517 | 369 | 2509 | 2488 | 278 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 308 | | | 369 | | | 2488 | 2517 | 369 | 2509 | 2488 | 278 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1253 | | | 1195 | | | 8 | 7 | 677 | 8 | 8 | 766 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 920 | 369 | 308 | 235 | 22 |
| Volume Left | 920 | 0 | 0 | 235 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1253 | 1700 | 1700 | 8 | 677 |
| Volume to Capacity | 0.73 | 0.22 | 0.18 | 29.54 | 0.03 |
| Queue Length 95th (ft) | 177 | 0 | 0 | Err | 2 |
| Control Delay (s) | 15.4 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | C | | | F | B |
| Approach Delay (s) | 11.0 | | 0.0 | 9163.1 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1277.9 | | | |
| Intersection Capacity Utilization | 138.2% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1B
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.16 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 308 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1024 | 197 | 20 | 400 | 0 | 0 | 0 | 0 | 80 | 0 | 875 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1056 | 203 | 21 | 412 | 0 | 0 | 0 | 0 | 82 | 0 | 902 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1056 | 68 | 21 | 412 | 0 | 0 | 0 | 0 | 82 | 465 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 37.0 | 8.6 | 23.4 | 23.4 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 38.0 | 9.6 | 24.4 | 24.4 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1106 | 237 | 117 | 717 | | | | | 498 | 445 | |
| v/s Ratio Prot | | c0.57 | 0.04 | | 0.22 | | | | | | c0.29 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.29 | 0.18 | 0.57 | | | | | 0.16 | 1.04 | |
| Uniform Delay, d1 | | 12.2 | 24.2 | 13.2 | 15.7 | | | | | 17.3 | 23.0 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 17.2 | 0.7 | 0.7 | 1.1 | | | | | 0.2 | 54.9 | |
| Delay (s) | | 29.3 | 24.8 | 13.9 | 16.8 | | | | | 17.5 | 77.9 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 28.6 | | | 16.7 | | | 0.0 | | | 72.8 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 42.9 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.98 | | | |
| Actuated Cycle Length (s) | 64.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 138.2% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1B
3: Old Fairhaven Pkwy & 30th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1846 | | 1770 | 1841 | | 1787 | 1685 | | 1770 | 1706 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.58 | 1.00 | |
| Satd. Flow (perm) | 151 | 1846 | | 151 | 1841 | | 1059 | 1685 | | 1077 | 1706 | |
| Volume (vph) | 80 | 852 | 55 | 118 | 927 | 80 | 55 | 46 | 104 | 230 | 70 | 88 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 85 | 906 | 59 | 126 | 986 | 85 | 59 | 49 | 111 | 245 | 74 | 94 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 84 | 0 | 0 | 51 | 0 |
| Lane Group Flow (vph) | 85 | 962 | 0 | 126 | 1067 | 0 | 59 | 76 | 0 | 245 | 117 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.9 | 48.2 | | 52.9 | 48.2 | | 20.4 | 20.4 | | 20.4 | 20.4 | |
| Effective Green, g (s) | 54.9 | 49.2 | | 54.9 | 49.2 | | 21.4 | 21.4 | | 21.4 | 21.4 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.62 | 0.56 | | 0.24 | 0.24 | | 0.24 | 0.24 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 1029 | | 198 | 1026 | | 257 | 408 | | 261 | 413 | |
| v/s Ratio Prot | 0.03 | 0.52 | | c0.04 | c0.58 | | | 0.05 | | | 0.07 | |
| v/s Ratio Perm | 0.24 | | | 0.35 | | | 0.06 | | | c0.23 | | |
| v/c Ratio | 0.43 | 0.94 | | 0.64 | 1.04 | | 0.23 | 0.19 | | 0.94 | 0.28 | |
| Uniform Delay, d1 | 20.3 | 18.1 | | 17.9 | 19.5 | | 26.8 | 26.5 | | 32.8 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 14.9 | | 4.9 | 39.2 | | 0.5 | 0.2 | | 38.9 | 0.4 | |
| Delay (s) | 20.9 | 32.9 | | 22.8 | 58.7 | | 27.3 | 26.8 | | 71.7 | 27.6 | |
| Level of Service | C | C | | C | E | | C | C | | E | C | |
| Approach Delay (s) | | 32.0 | | | 54.9 | | | 26.9 | | | 53.8 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 44.3 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.98 | | | |
| Actuated Cycle Length (s) | 88.3 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 93.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1B
4: Old Fairhaven Pkwy & 24th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 972 | 10 | 30 | 1000 | 50 | 10 | 5 | 20 | 55 | 5 | 18 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 11 | 992 | 10 | 31 | 1020 | 51 | 10 | 5 | 20 | 56 | 5 | 18 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1071 | | | 1002 | | | 2122 | 2152 | 997 | 2144 | 2132 | 1046 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1071 | | | 1002 | | | 2122 | 2152 | 997 | 2144 | 2132 | 1046 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 96 | | | 66 | 89 | 93 | 0 | 89 | 93 |
| cM capacity (veh/h) | 651 | | | 695 | | | 30 | 45 | 295 | 29 | 47 | 280 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 1002 | 31 | 1071 | 15 | 20 | 61 | 18 |
| Volume Left | 11 | 0 | 31 | 0 | 10 | 0 | 56 | 0 |
| Volume Right | 0 | 10 | 0 | 51 | 0 | 20 | 0 | 18 |
| cSH | 651 | 1700 | 695 | 1700 | 33 | 295 | 30 | 280 |
| Volume to Capacity | 0.02 | 0.59 | 0.04 | 0.63 | 0.46 | 0.07 | 2.05 | 0.07 |
| Queue Length 95th (ft) | 1 | 0 | 3 | 0 | 38 | 6 | 178 | 5 |
| Control Delay (s) | 10.6 | 0.0 | 10.4 | 0.0 | 183.2 | 18.1 | 769.7 | 18.8 |
| Lane LOS | B | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 0.3 | | 88.9 | | 596.4 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 22.9 | | | |
| Intersection Capacity Utilization | 72.3% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

2022 With Project PM Peak, Alt 1B
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1848 | | 1805 | 1880 | |
| Flt Permitted | | 0.77 | | | 0.82 | | 0.16 | 1.00 | | 0.30 | 1.00 | |
| Satd. Flow (perm) | | 1415 | | | 1465 | | 304 | 1848 | | 571 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 81 | 100 | 65 | 90 | 400 | 89 | 120 | 599 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 89 | 110 | 71 | 99 | 440 | 98 | 132 | 658 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 23 | 0 | 0 | 15 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 247 | 0 | 99 | 523 | 0 | 132 | 702 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 566 | | | 586 | | 138 | 840 | | 260 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.28 | | | c0.37 | |
| v/s Ratio Perm | | c0.23 | | | 0.17 | | 0.33 | | | 0.23 | | |
| v/c Ratio | | 0.57 | | | 0.42 | | 0.72 | 0.62 | | 0.51 | 0.82 | |
| Uniform Delay, d1 | | 12.8 | | | 11.9 | | 12.1 | 11.4 | | 10.6 | 13.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.1 | | | 2.2 | | 27.3 | 3.5 | | 6.9 | 8.7 | |
| Delay (s) | | 16.9 | | | 14.1 | | 39.4 | 14.9 | | 17.6 | 21.8 | |
| Level of Service | | B | | | B | | D | B | | B | C | |
| Approach Delay (s) | | 16.9 | | | 14.1 | | | 18.7 | | | 21.1 | |
| Approach LOS | | B | | | B | | | B | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 18.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.70 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 74.7% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

2022 With Project PM Peak, Alt 1B
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1739 | | 1787 | 1689 | | 1805 | 1900 | 1615 | 1787 | 1869 | |
| Flt Permitted | 0.37 | 1.00 | | 0.40 | 1.00 | | 0.30 | 1.00 | 1.00 | 0.34 | 1.00 | |
| Satd. Flow (perm) | 667 | 1739 | | 761 | 1689 | | 561 | 1900 | 1615 | 646 | 1869 | |
| Volume (vph) | 10 | 160 | 40 | 385 | 120 | 255 | 35 | 309 | 266 | 295 | 450 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 43 | 414 | 129 | 274 | 38 | 332 | 286 | 317 | 484 | 22 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 94 | 0 | 0 | 0 | 190 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 203 | 0 | 414 | 309 | 0 | 38 | 332 | 96 | 317 | 504 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 19.0 | 17.9 | | 29.9 | 23.8 | | 28.8 | 25.3 | 25.3 | 37.8 | 29.8 | |
| Effective Green, g (s) | 21.0 | 18.9 | | 30.9 | 24.8 | | 30.8 | 26.3 | 26.3 | 39.3 | 30.8 | |
| Actuated g/C Ratio | 0.27 | 0.24 | | 0.40 | 0.32 | | 0.39 | 0.34 | 0.34 | 0.50 | 0.39 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 207 | 420 | | 406 | 536 | | 293 | 639 | 543 | 456 | 736 | |
| v/s Ratio Prot | 0.00 | 0.12 | | c0.10 | 0.18 | | 0.01 | 0.17 | | c0.08 | 0.27 | |
| v/s Ratio Perm | 0.01 | | | c0.30 | | | 0.04 | | 0.06 | c0.27 | | |
| v/c Ratio | 0.05 | 0.48 | | 1.02 | 0.58 | | 0.13 | 0.52 | 0.18 | 0.70 | 0.69 | |
| Uniform Delay, d1 | 21.3 | 25.5 | | 22.9 | 22.3 | | 15.3 | 20.9 | 18.3 | 13.0 | 19.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 49.8 | 1.5 | | 0.2 | 3.0 | 0.7 | 4.6 | 5.1 | |
| Delay (s) | 21.4 | 26.3 | | 72.7 | 23.8 | | 15.5 | 23.9 | 19.0 | 17.6 | 24.8 | |
| Level of Service | C | C | | E | C | | B | C | B | B | C | |
| Approach Delay (s) | | 26.1 | | | 48.6 | | | 21.3 | | | 22.0 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 30.8 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.82 | | | |
| Actuated Cycle Length (s) | 78.2 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 78.1% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1B
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | | 4.0 | 4.0 | | 4.0 | | 4.0 | |
| Lane Util. Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Frt | 0.99 | | 0.85 | | | 1.00 | 0.98 | | 0.85 | | 0.99 | |
| Flt Protected | 0.95 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (prot) | 1784 | | 1553 | | | 1861 | 1852 | | 1599 | | 1800 | |
| Flt Permitted | 0.95 | | 1.00 | | | 0.88 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (perm) | 1784 | | 1553 | | | 1633 | 1852 | | 1599 | | 1800 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 490 | 660 | 75 | 255 | 5 | 150 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 533 | 717 | 82 | 277 | 5 | 163 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 136 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 175 | 0 | 5 | 0 | 0 | 545 | 799 | 0 | 141 | 0 | 177 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | Perm | Perm | Perm | | | | Perm | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | 7 | 2 | 2 | | | | 6 | | | |
| Actuated Green, G (s) | 12.7 | | 12.7 | | | 39.3 | 39.3 | | 39.3 | | 12.7 | |
| Effective Green, g (s) | 13.7 | | 13.7 | | | 40.3 | 40.3 | | 40.3 | | 13.7 | |
| Actuated g/C Ratio | 0.17 | | 0.17 | | | 0.51 | 0.51 | | 0.51 | | 0.17 | |
| Clearance Time (s) | 5.0 | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | 307 | | 267 | | | 826 | 936 | | 809 | | 309 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.43 | | | | c0.10 | |
| v/s Ratio Perm | | | 0.00 | | | 0.33 | | | 0.09 | | | |
| v/c Ratio | 0.57 | | 0.02 | | | 0.66 | 0.85 | | 0.17 | | 0.57 | |
| Uniform Delay, d1 | 30.3 | | 27.4 | | | 14.6 | 17.1 | | 10.7 | | 30.3 | |
| Progression Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Incremental Delay, d2 | 2.5 | | 0.0 | | | 1.9 | 9.8 | | 0.5 | | 2.5 | |
| Delay (s) | 32.8 | | 27.4 | | | 16.5 | 26.9 | | 11.1 | | 32.8 | |
| Level of Service | C | | C | | | B | C | | B | | C | |
| Approach Delay (s) | 32.7 | | | | | 16.5 | 22.8 | | | | 32.8 | |
| Approach LOS | C | | | | | B | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 22.9 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.74 | | | |
| Actuated Cycle Length (s) | 79.7 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 67.4% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak, Alt 1B
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 19 | 0 | 130 | 10 | 230 | 36 | 244 | 205 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 21 | 0 | 141 | 11 | 242 | 39 | 265 | 216 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1153 | 1051 | 218 | 1039 | 1034 | 262 | 221 | | | 281 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1153 | 1051 | 218 | 1039 | 1034 | 262 | 221 | | | 281 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 91 | 100 | 99 | 88 | 100 | 82 | 99 | | | 79 | | |
| cM capacity (veh/h) | 117 | 178 | 811 | 172 | 183 | 777 | 1348 | | | 1281 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 21 | 21 | 141 | 11 | 281 | 265 | 221 |
| Volume Left | 11 | 21 | 0 | 11 | 0 | 265 | 0 |
| Volume Right | 11 | 0 | 141 | 0 | 39 | 0 | 5 |
| cSH | 205 | 172 | 777 | 1348 | 1700 | 1281 | 1700 |
| Volume to Capacity | 0.10 | 0.12 | 0.18 | 0.01 | 0.17 | 0.21 | 0.13 |
| Queue Length 95th (ft) | 8 | 10 | 17 | 1 | 0 | 19 | 0 |
| Control Delay (s) | 24.6 | 28.8 | 10.7 | 7.7 | 0.0 | 8.5 | 0.0 |
| Lane LOS | C | D | B | A | | A | |
| Approach Delay (s) | 24.6 | 13.0 | | 0.3 | | 4.7 | |
| Approach LOS | C | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.2 | | | |
| Intersection Capacity Utilization | 48.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

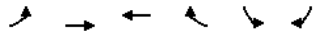
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 180 | 83 | 48 | 150 | 70 | 44 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 191 | 88 | 51 | 160 | 74 | 47 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 247 | 51 | | | 51 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 247 | 51 | | | 51 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 73 | 91 | | | 95 | |
| cM capacity (veh/h) | 708 | 1020 | | | 1549 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 191 | 88 | 51 | 160 | 121 |
| Volume Left | 191 | 0 | 0 | 0 | 74 |
| Volume Right | 0 | 88 | 0 | 160 | 0 |
| cSH | 708 | 1020 | 1700 | 1700 | 1549 |
| Volume to Capacity | 0.27 | 0.09 | 0.03 | 0.09 | 0.05 |
| Queue Length 95th (ft) | 27 | 7 | 0 | 0 | 4 |
| Control Delay (s) | 12.0 | 8.9 | 0.0 | 0.0 | 4.7 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 11.0 | | 0.0 | | 4.7 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.0 | | |
| Intersection Capacity Utilization | 29.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 65 | 10 | 5 | 5 | 45 | 73 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 75 | 11 | 6 | 6 | 52 | 84 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 170 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 170 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 95 | | | | 93 | 92 |
| cM capacity (veh/h) | 1595 | | | | 787 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 86 | 11 | 136 |
| Volume Left | 75 | 0 | 52 |
| Volume Right | 0 | 6 | 84 |
| cSH | 1595 | 1700 | 945 |
| Volume to Capacity | 0.05 | 0.01 | 0.14 |
| Queue Length 95th (ft) | 4 | 0 | 13 |
| Control Delay (s) | 6.4 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.4 | 0.0 | 9.4 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.9 | | |
| Intersection Capacity Utilization | 24.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 360 | 5 | 5 | 449 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 391 | 5 | 5 | 488 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 893 | 394 | | | 397 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 893 | 394 | | | 397 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 99 | | | 100 | |
| cM capacity (veh/h) | 311 | 655 | | | 1162 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 397 | 493 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 421 | 1700 | 1162 |
| Volume to Capacity | 0.03 | 0.23 | 0.00 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 13.8 | 0.0 | 0.1 |
| Lane LOS | B | | A |
| Approach Delay (s) | 13.8 | 0.0 | 0.1 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 37.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1C
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 717 | 145 | 0 | 0 | 276 | 35 | 138 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 874 | 177 | 0 | 0 | 337 | 43 | 168 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 177 | | | 2284 | 2305 | 177 | 2290 | 2284 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 177 | | | 2284 | 2305 | 177 | 2290 | 2284 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 25 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1393 | | | 11 | 10 | 861 | 11 | 10 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 874 | 177 | 379 | 168 | 6 |
| Volume Left | 874 | 0 | 0 | 168 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 11 | 861 |
| Volume to Capacity | 0.75 | 0.10 | 0.22 | 15.77 | 0.01 |
| Queue Length 95th (ft) | 186 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.6 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.8 | | 0.0 | 9649.7 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1057.6 | | | |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 1C
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 797 | 148 | 10 | 404 | 0 | 0 | 0 | 0 | 20 | 0 | 593 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 906 | 168 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 0 | 674 |
| RTOR Reduction (vph) | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 906 | 56 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 319 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.4 | 7.0 | 1.2 | 30.6 | | | | | 15.8 | 15.8 | |
| Effective Green, g (s) | | 37.4 | 8.0 | 2.2 | 31.6 | | | | | 16.8 | 16.8 | |
| Actuated g/C Ratio | | 0.55 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 999 | 182 | 57 | 861 | | | | | 418 | 374 | |
| v/s Ratio Prot | | c0.50 | | 0.01 | 0.25 | | | | | | c0.21 | |
| v/s Ratio Perm | | | c0.04 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.91 | 0.31 | 0.19 | 0.53 | | | | | 0.06 | 0.85 | |
| Uniform Delay, d1 | | 13.9 | 27.7 | 32.2 | 13.1 | | | | | 19.7 | 24.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 11.6 | 1.0 | 1.7 | 0.6 | | | | | 0.1 | 16.8 | |
| Delay (s) | | 25.5 | 28.6 | 33.9 | 13.8 | | | | | 19.8 | 41.4 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 26.0 | | | 14.2 | | | 0.0 | | | 40.7 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 28.1 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.88 | | | |
| Actuated Cycle Length (s) | 68.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 94.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project AM Peak - Alt 1C
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.91 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1798 | | 1719 | 1771 | | 1703 | 1625 | | 1770 | 1751 | |
| Flt Permitted | 0.10 | 1.00 | | 0.20 | 1.00 | | 0.71 | 1.00 | | 0.54 | 1.00 | |
| Satd. Flow (perm) | 173 | 1798 | | 360 | 1771 | | 1269 | 1625 | | 1010 | 1751 | |
| Volume (vph) | 58 | 690 | 30 | 45 | 722 | 120 | 40 | 55 | 90 | 140 | 40 | 26 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 66 | 784 | 34 | 51 | 820 | 136 | 45 | 62 | 102 | 159 | 45 | 30 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 70 | 0 | 0 | 24 | 0 |
| Lane Group Flow (vph) | 66 | 816 | 0 | 51 | 950 | 0 | 45 | 94 | 0 | 159 | 51 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 56.1 | 51.5 | | 53.7 | 50.3 | | 16.1 | 16.1 | | 16.1 | 16.1 | |
| Effective Green, g (s) | 58.1 | 52.5 | | 55.7 | 51.3 | | 17.1 | 17.1 | | 17.1 | 17.1 | |
| Actuated g/C Ratio | 0.68 | 0.61 | | 0.65 | 0.60 | | 0.20 | 0.20 | | 0.20 | 0.20 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 218 | 1098 | | 303 | 1056 | | 252 | 323 | | 201 | 348 | |
| v/s Ratio Prot | c0.02 | 0.45 | | 0.01 | c0.54 | | | 0.06 | | | 0.03 | |
| v/s Ratio Perm | 0.19 | | | 0.10 | | | 0.04 | | | c0.16 | | |
| v/c Ratio | 0.30 | 0.74 | | 0.17 | 0.90 | | 0.18 | 0.29 | | 0.79 | 0.15 | |
| Uniform Delay, d1 | 13.5 | 11.9 | | 8.8 | 15.1 | | 28.6 | 29.3 | | 32.8 | 28.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 2.8 | | 0.1 | 10.3 | | 0.3 | 0.5 | | 18.8 | 0.2 | |
| Delay (s) | 13.8 | 14.7 | | 8.9 | 25.4 | | 29.0 | 29.8 | | 51.6 | 28.6 | |
| Level of Service | B | B | | A | C | | C | C | | D | C | |
| Approach Delay (s) | | 14.6 | | | 24.5 | | | 29.6 | | | 44.2 | |
| Approach LOS | | B | | | C | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 23.2 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.83 | | | |
| Actuated Cycle Length (s) | 86.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 74.4% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project AM Peak - Alt 1C
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 588 | 40 | 85 | 678 | 65 | 91 | 22 | 195 | 35 | 10 | 15 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 11 | 646 | 44 | 93 | 745 | 71 | 100 | 24 | 214 | 38 | 11 | 16 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 816 | | | 690 | | | 1644 | 1693 | 668 | 1862 | 1680 | 781 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 816 | | | 690 | | | 1644 | 1693 | 668 | 1862 | 1680 | 781 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 90 | | | 0 | 70 | 53 | 0 | 87 | 96 |
| cM capacity (veh/h) | 798 | | | 895 | | | 62 | 82 | 456 | 21 | 83 | 393 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 690 | 93 | 816 | 124 | 214 | 49 | 16 |
| Volume Left | 11 | 0 | 93 | 0 | 100 | 0 | 38 | 0 |
| Volume Right | 0 | 44 | 0 | 71 | 0 | 214 | 0 | 16 |
| cSH | 798 | 1700 | 895 | 1700 | 65 | 456 | 25 | 393 |
| Volume to Capacity | 0.01 | 0.41 | 0.10 | 0.48 | 1.90 | 0.47 | 1.98 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 9 | 0 | 286 | 61 | 153 | 3 |
| Control Delay (s) | 9.6 | 0.0 | 9.5 | 0.0 | 561.1 | 19.7 | 791.6 | 14.6 |
| Lane LOS | A | | A | | F | C | F | B |
| Approach Delay (s) | 0.2 | | 1.0 | | 218.3 | | 597.3 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 56.7 | | | |
| Intersection Capacity Utilization | 65.8% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1723 | | 1736 | 1793 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.93 | | 0.54 | 1.00 | | 0.28 | 1.00 | |
| Satd. Flow (perm) | | 1509 | | | 1623 | | 993 | 1793 | | 493 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 30 | 55 | 60 | 70 | 437 | 62 | 30 | 241 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 32 | 59 | 65 | 75 | 470 | 67 | 32 | 259 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 10 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 118 | 0 | 75 | 527 | 0 | 32 | 278 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 634 | | | 682 | | 417 | 753 | | 207 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.29 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.07 | | 0.08 | | | 0.06 | | |
| v/c Ratio | | 0.19 | | | 0.17 | | 0.18 | 0.70 | | 0.15 | 0.38 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 11.9 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.6 | | 0.9 | 5.3 | | 1.6 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.6 | | 10.0 | 17.3 | | 10.6 | 11.5 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.6 | | | 16.4 | | | 11.4 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.5 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 55.4% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1590 | | 1687 | 1620 | | 1770 | 1863 | 1583 | 1687 | 1760 | |
| Flt Permitted | 0.46 | 1.00 | | 0.52 | 1.00 | | 0.64 | 1.00 | 1.00 | 0.36 | 1.00 | |
| Satd. Flow (perm) | 751 | 1590 | | 927 | 1620 | | 1198 | 1863 | 1583 | 634 | 1760 | |
| Volume (vph) | 10 | 80 | 20 | 249 | 150 | 211 | 39 | 333 | 281 | 155 | 151 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 22 | 280 | 169 | 237 | 44 | 374 | 316 | 174 | 170 | 11 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 66 | 0 | 0 | 0 | 202 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 100 | 0 | 280 | 340 | 0 | 44 | 374 | 114 | 174 | 179 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.8 | 11.8 | | 26.4 | 20.4 | | 27.5 | 24.3 | 24.3 | 29.9 | 25.5 | |
| Effective Green, g (s) | 14.8 | 12.8 | | 27.4 | 21.4 | | 29.5 | 25.3 | 25.3 | 31.9 | 26.5 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.46 | 0.38 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 182 | 290 | | 477 | 495 | | 538 | 672 | 571 | 370 | 665 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.09 | c0.21 | | 0.00 | c0.20 | | c0.04 | 0.10 | |
| v/s Ratio Perm | 0.01 | | | 0.14 | | | 0.03 | | 0.07 | 0.18 | | |
| v/c Ratio | 0.06 | 0.34 | | 0.59 | 0.69 | | 0.08 | 0.56 | 0.20 | 0.47 | 0.27 | |
| Uniform Delay, d1 | 22.0 | 25.0 | | 15.7 | 21.4 | | 12.1 | 17.9 | 15.4 | 12.3 | 15.1 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 1.8 | 3.9 | | 0.1 | 3.3 | 0.8 | 0.9 | 1.0 | |
| Delay (s) | 22.1 | 25.7 | | 17.6 | 25.3 | | 12.1 | 21.2 | 16.2 | 13.2 | 16.1 | |
| Level of Service | C | C | | B | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.4 | | | 22.2 | | | 18.5 | | | 14.7 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 19.6 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.58 | | | |
| Actuated Cycle Length (s) | 70.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 56.9% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Hawthorne & 12th St

2022 With Project AM Peak - Alt 1C
1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | | 4.0 | 4.0 | | 4.0 | | 4.0 | |
| Lane Util. Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Frt | 0.99 | | 0.85 | | | 1.00 | 0.99 | | 0.85 | | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (prot) | 1785 | | 1553 | | | 1807 | 1734 | | 1553 | | 1597 | |
| Flt Permitted | 0.95 | | 1.00 | | | 0.99 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (perm) | 1785 | | 1553 | | | 1789 | 1734 | | 1553 | | 1597 | |
| Volume (vph) | 205 | 8 | 5 | 5 | 8 | 363 | 140 | 15 | 245 | 5 | 125 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 10 | 6 | 6 | 10 | 471 | 182 | 19 | 258 | 5 | 132 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 157 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 276 | 0 | 6 | 0 | 0 | 487 | 201 | 0 | 101 | 0 | 150 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | Perm | Perm | Perm | | | | Perm | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | 7 | 2 | 2 | | | | 6 | | | |
| Actuated Green, G (s) | 14.1 | | 14.1 | | | 24.3 | 24.3 | | 24.3 | | 11.1 | |
| Effective Green, g (s) | 15.1 | | 15.1 | | | 25.3 | 25.3 | | 25.3 | | 12.1 | |
| Actuated g/C Ratio | 0.23 | | 0.23 | | | 0.39 | 0.39 | | 0.39 | | 0.19 | |
| Clearance Time (s) | 5.0 | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | 418 | | 364 | | | 702 | 680 | | 609 | | 300 | |
| v/s Ratio Prot | c0.15 | | | | | | 0.12 | | | | c0.09 | |
| v/s Ratio Perm | | | 0.00 | | | c0.27 | | | 0.07 | | | |
| v/c Ratio | 0.66 | | 0.02 | | | 0.69 | 0.30 | | 0.17 | | 0.50 | |
| Uniform Delay, d1 | 22.4 | | 19.0 | | | 16.4 | 13.5 | | 12.7 | | 23.5 | |
| Progression Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Incremental Delay, d2 | 3.9 | | 0.0 | | | 3.0 | 1.1 | | 0.6 | | 1.3 | |
| Delay (s) | 26.3 | | 19.0 | | | 19.3 | 14.6 | | 13.3 | | 24.8 | |
| Level of Service | C | | B | | | B | B | | B | | C | |
| Approach Delay (s) | 26.1 | | | | | 19.3 | 13.9 | | | | 24.8 | |
| Approach LOS | C | | | | | B | B | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 19.5 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.64 | | | |
| Actuated Cycle Length (s) | 64.5 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 59.9% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
8: Viewcrest & Chuckanut Dr

2022 With Project AM Peak - Alt 1C
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 63 | 0 | 116 | 5 | 90 | 77 | 57 | 50 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 68 | 0 | 126 | 6 | 115 | 84 | 62 | 64 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 446 | 403 | 67 | 364 | 364 | 157 | 71 | | | 199 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 446 | 403 | 67 | 364 | 364 | 157 | 71 | | | 199 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 99 | 100 | 99 | 88 | 100 | 86 | 100 | | | 95 | | |
| cM capacity (veh/h) | 435 | 510 | 1002 | 566 | 536 | 888 | 1505 | | | 1373 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 68 | 126 | 6 | 199 | 62 | 71 |
| Volume Left | 6 | 68 | 0 | 6 | 0 | 62 | 0 |
| Volume Right | 6 | 0 | 126 | 0 | 84 | 0 | 6 |
| cSH | 606 | 566 | 888 | 1505 | 1700 | 1373 | 1700 |
| Volume to Capacity | 0.02 | 0.12 | 0.14 | 0.00 | 0.12 | 0.05 | 0.04 |
| Queue Length 95th (ft) | 2 | 10 | 12 | 0 | 0 | 4 | 0 |
| Control Delay (s) | 11.1 | 12.2 | 9.7 | 7.4 | 0.0 | 7.7 | 0.0 |
| Lane LOS | B | B | A | A | | A | |
| Approach Delay (s) | 11.1 | 10.6 | | 0.2 | | 3.6 | |
| Approach LOS | B | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.0 | | | |
| Intersection Capacity Utilization | 30.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

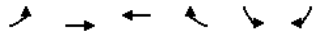
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 100 | 55 | 42 | 55 | 25 | 53 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 109 | 60 | 46 | 60 | 27 | 58 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 158 | 46 | | | 46 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 158 | 46 | | | 46 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 87 | 94 | | | 98 | |
| cM capacity (veh/h) | 812 | 1015 | | | 1512 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 109 | 60 | 46 | 60 | 85 |
| Volume Left | 109 | 0 | 0 | 0 | 27 |
| Volume Right | 0 | 60 | 0 | 60 | 0 |
| cSH | 812 | 1015 | 1700 | 1700 | 1512 |
| Volume to Capacity | 0.13 | 0.06 | 0.03 | 0.04 | 0.02 |
| Queue Length 95th (ft) | 12 | 5 | 0 | 0 | 1 |
| Control Delay (s) | 10.1 | 8.8 | 0.0 | 0.0 | 2.5 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.6 | | 0.0 | | 2.5 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.1 | | |
| Intersection Capacity Utilization | 23.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 55 | 5 | 5 | 35 | 5 | 25 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 65 | 6 | 6 | 42 | 6 | 30 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 164 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 164 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 96 | | | | 99 | 97 |
| cM capacity (veh/h) | 1573 | | | | 779 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 71 | 48 | 36 |
| Volume Left | 65 | 0 | 6 |
| Volume Right | 0 | 42 | 30 |
| cSH | 1573 | 1700 | 979 |
| Volume to Capacity | 0.04 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 3 | 0 | 3 |
| Control Delay (s) | 6.8 | 0.0 | 8.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.8 | 0.0 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.2 | | |
| Intersection Capacity Utilization | 20.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 261 | 5 | 5 | 122 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 284 | 5 | 5 | 133 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 430 | 286 | | | 289 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 430 | 286 | | | 289 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 580 | 753 | | | 1273 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 289 | 138 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 655 | 1700 | 1273 |
| Volume to Capacity | 0.02 | 0.17 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 10.6 | 0.0 | 0.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.6 | 0.0 | 0.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.4 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis 1: Old Fairhaven Pkwy & I-5 NB Ramps
2022 With Project PM Peak-Alt 1C 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 856 | 343 | 0 | 0 | 231 | 55 | 219 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 920 | 369 | 0 | 0 | 248 | 59 | 235 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 308 | | | 369 | | | 2488 | 2517 | 369 | 2509 | 2488 | 278 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 308 | | | 369 | | | 2488 | 2517 | 369 | 2509 | 2488 | 278 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1253 | | | 1195 | | | 8 | 7 | 677 | 8 | 8 | 766 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 920 | 369 | 308 | 235 | 22 |
| Volume Left | 920 | 0 | 0 | 235 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1253 | 1700 | 1700 | 8 | 677 |
| Volume to Capacity | 0.73 | 0.22 | 0.18 | 29.54 | 0.03 |
| Queue Length 95th (ft) | 177 | 0 | 0 | Err | 2 |
| Control Delay (s) | 15.4 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | C | | | F | B |
| Approach Delay (s) | 11.0 | | 0.0 | 9163.1 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1277.9 | | | |
| Intersection Capacity Utilization | 138.2% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis 2: Old Fairhaven Pkwy & I-5 SB Ramps
2022 With Project PM Peak-Alt 1C 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.16 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 308 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1024 | 197 | 20 | 400 | 0 | 0 | 0 | 0 | 80 | 0 | 875 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1056 | 203 | 21 | 412 | 0 | 0 | 0 | 0 | 82 | 0 | 902 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1056 | 68 | 21 | 412 | 0 | 0 | 0 | 0 | 82 | 465 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | | Perm | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 37.0 | 8.6 | 23.4 | 23.4 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 38.0 | 9.6 | 24.4 | 24.4 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1106 | 237 | 117 | 717 | | | | | 498 | 445 | |
| v/s Ratio Prot | | c0.57 | 0.04 | | 0.22 | | | | | | c0.29 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.29 | 0.18 | 0.57 | | | | | 0.16 | 1.04 | |
| Uniform Delay, d1 | | 12.2 | 24.2 | 13.2 | 15.7 | | | | | 17.3 | 23.0 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 17.2 | 0.7 | 0.7 | 1.1 | | | | | 0.2 | 54.9 | |
| Delay (s) | | 29.3 | 24.8 | 13.9 | 16.8 | | | | | 17.5 | 77.9 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 28.6 | | | 16.7 | | | 0.0 | | | 72.8 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 42.9 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.98 | | | |
| Actuated Cycle Length (s) | 64.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 138.2% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 3: Old Fairhaven Pkwy & 30th St
2022 With Project PM Peak-Alt 1C — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1846 | | 1770 | 1841 | | 1787 | 1688 | | 1770 | 1706 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.66 | 1.00 | |
| Satd. Flow (perm) | 150 | 1846 | | 150 | 1841 | | 1047 | 1688 | | 1227 | 1706 | |
| Volume (vph) | 91 | 881 | 55 | 90 | 955 | 80 | 55 | 35 | 75 | 230 | 70 | 88 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 97 | 937 | 59 | 96 | 1016 | 85 | 59 | 37 | 80 | 245 | 74 | 94 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 62 | 0 | 0 | 52 | 0 |
| Lane Group Flow (vph) | 97 | 993 | 0 | 96 | 1098 | 0 | 59 | 55 | 0 | 245 | 116 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 53.3 | 48.7 | | 53.3 | 48.7 | | 19.2 | 19.2 | | 19.2 | 19.2 | |
| Effective Green, g (s) | 55.3 | 49.7 | | 55.3 | 49.7 | | 20.2 | 20.2 | | 20.2 | 20.2 | |
| Actuated g/C Ratio | 0.63 | 0.57 | | 0.63 | 0.57 | | 0.23 | 0.23 | | 0.23 | 0.23 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 1049 | | 198 | 1046 | | 242 | 390 | | 283 | 394 | |
| v/s Ratio Prot | c0.03 | 0.54 | | 0.03 | c0.60 | | | 0.03 | | | 0.07 | |
| v/s Ratio Perm | 0.28 | | | 0.27 | | | 0.06 | | | c0.20 | | |
| v/c Ratio | 0.49 | 0.95 | | 0.48 | 1.05 | | 0.24 | 0.14 | | 0.87 | 0.30 | |
| Uniform Delay, d1 | 20.4 | 17.7 | | 17.8 | 18.9 | | 27.4 | 26.8 | | 32.3 | 27.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.7 | 16.4 | | 0.7 | 41.8 | | 0.5 | 0.2 | | 23.0 | 0.4 | |
| Delay (s) | 21.1 | 34.1 | | 18.4 | 60.7 | | 28.0 | 26.9 | | 55.4 | 28.2 | |
| Level of Service | C | C | | B | E | | C | C | | E | C | |
| Approach Delay (s) | | 32.9 | | | 57.3 | | | 27.3 | | | 44.3 | |
| Approach LOS | | C | | | E | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 44.4 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.96 | | | |
| Actuated Cycle Length (s) | 87.5 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 92.7% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 4: Old Fairhaven Pkwy & 24th St
2022 With Project PM Peak-Alt 1C — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 827 | 112 | 219 | 814 | 50 | 87 | 14 | 150 | 55 | 22 | 15 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 10 | 844 | 114 | 223 | 831 | 51 | 89 | 14 | 153 | 56 | 22 | 15 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 882 | | | 958 | | | 2226 | 2250 | 901 | 2328 | 2282 | 856 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 882 | | | 958 | | | 2226 | 2250 | 901 | 2328 | 2282 | 856 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 69 | | | 0 | 49 | 54 | 0 | 18 | 96 |
| cM capacity (veh/h) | 767 | | | 722 | | | 7 | 28 | 335 | 7 | 27 | 360 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 10 | 958 | 223 | 882 | 103 | 153 | 79 | 15 |
| Volume Left | 10 | 0 | 223 | 0 | 89 | 0 | 56 | 0 |
| Volume Right | 0 | 114 | 0 | 51 | 0 | 153 | 0 | 15 |
| cSH | 767 | 1700 | 722 | 1700 | 8 | 335 | 9 | 360 |
| Volume to Capacity | 0.01 | 0.56 | 0.31 | 0.52 | 12.55 | 0.46 | 9.24 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 33 | 0 | Err | 57 | Err | 3 |
| Control Delay (s) | 9.8 | 0.0 | 12.2 | 0.0 | Err | 24.4 | Err | 15.4 |
| Lane LOS | A | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 2.5 | | 4038.1 | | 8371.2 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 752.2 | | | |
| Intersection Capacity Utilization | 84.7% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1852 | | 1805 | 1880 | |
| Flt Permitted | | 0.78 | | | 0.84 | | 0.16 | 1.00 | | 0.31 | 1.00 | |
| Satd. Flow (perm) | | 1429 | | | 1511 | | 304 | 1852 | | 587 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 67 | 100 | 65 | 90 | 400 | 81 | 120 | 599 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 74 | 110 | 71 | 99 | 440 | 89 | 132 | 658 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 25 | 0 | 0 | 13 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 230 | 0 | 99 | 516 | 0 | 132 | 702 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 572 | | | 604 | | 138 | 842 | | 267 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.28 | | | c0.37 | |
| v/s Ratio Perm | | c0.23 | | | 0.15 | | 0.33 | | | 0.22 | | |
| v/c Ratio | | 0.56 | | | 0.38 | | 0.72 | 0.61 | | 0.49 | 0.82 | |
| Uniform Delay, d1 | | 12.8 | | | 11.7 | | 12.1 | 11.3 | | 10.6 | 13.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.0 | | | 1.8 | | 27.3 | 3.3 | | 6.4 | 8.7 | |
| Delay (s) | | 16.7 | | | 13.5 | | 39.4 | 14.7 | | 17.0 | 21.8 | |
| Level of Service | | B | | | B | | D | B | | B | C | |
| Approach Delay (s) | | 16.7 | | | 13.5 | | | 18.6 | | | 21.0 | |
| Approach LOS | | B | | | B | | | B | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 18.6 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.70 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 76.5% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1739 | | 1787 | 1684 | | 1805 | 1900 | 1615 | 1787 | 1867 | |
| Flt Permitted | 0.33 | 1.00 | | 0.40 | 1.00 | | 0.37 | 1.00 | 1.00 | 0.38 | 1.00 | |
| Satd. Flow (perm) | 594 | 1739 | | 761 | 1684 | | 700 | 1900 | 1615 | 714 | 1867 | |
| Volume (vph) | 10 | 160 | 40 | 192 | 120 | 277 | 35 | 279 | 120 | 337 | 394 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 43 | 206 | 129 | 298 | 38 | 300 | 129 | 362 | 424 | 22 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 102 | 0 | 0 | 0 | 86 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 203 | 0 | 206 | 325 | 0 | 38 | 300 | 43 | 362 | 444 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 19.0 | 17.9 | | 29.9 | 23.8 | | 28.8 | 25.3 | 25.3 | 37.8 | 29.8 | |
| Effective Green, g (s) | 21.0 | 18.9 | | 30.9 | 24.8 | | 30.8 | 26.3 | 26.3 | 39.3 | 30.8 | |
| Actuated g/C Ratio | 0.27 | 0.24 | | 0.40 | 0.32 | | 0.39 | 0.34 | 0.34 | 0.50 | 0.39 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 189 | 420 | | 406 | 534 | | 339 | 639 | 543 | 482 | 735 | |
| v/s Ratio Prot | 0.00 | 0.12 | | c0.05 | c0.19 | | 0.01 | 0.16 | | c0.09 | 0.24 | |
| v/s Ratio Perm | 0.01 | | | 0.15 | | | 0.04 | | 0.03 | c0.29 | | |
| v/c Ratio | 0.06 | 0.48 | | 0.51 | 0.61 | | 0.11 | 0.47 | 0.08 | 0.75 | 0.60 | |
| Uniform Delay, d1 | 21.3 | 25.5 | | 16.7 | 22.6 | | 15.0 | 20.5 | 17.7 | 13.9 | 18.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 1.0 | 2.0 | | 0.1 | 2.5 | 0.3 | 6.5 | 3.7 | |
| Delay (s) | 21.5 | 26.3 | | 17.7 | 24.6 | | 15.2 | 22.9 | 18.0 | 20.4 | 22.5 | |
| Level of Service | C | C | | B | C | | B | C | B | C | C | |
| Approach Delay (s) | | 26.1 | | | 22.3 | | | 20.9 | | | 21.6 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 22.1 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.66 | | | |
| Actuated Cycle Length (s) | 78.2 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 75.0% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

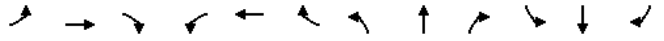
| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.96 | | | | 0.98 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1780 | | | | | 1860 | 1797 | | | | 1783 | |
| Flt Permitted | 0.96 | | | | | 0.89 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1780 | | | | | 1660 | 1797 | | | | 1783 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 419 | 526 | 5 | 255 | 5 | 45 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 455 | 572 | 5 | 277 | 5 | 49 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 180 | 0 | 0 | 0 | 0 | 467 | 838 | 0 | 0 | 0 | 56 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.5 | | | | | 39.2 | 39.2 | | | | 7.9 | |
| Effective Green, g (s) | 13.5 | | | | | 40.2 | 40.2 | | | | 8.9 | |
| Actuated g/C Ratio | 0.18 | | | | | 0.54 | 0.54 | | | | 0.12 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 322 | | | | | 895 | 968 | | | | 213 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.47 | | | | c0.03 | |
| v/s Ratio Perm | | | | | | 0.28 | | | | | | |
| v/c Ratio | 0.56 | | | | | 0.52 | 0.87 | | | | 0.26 | |
| Uniform Delay, d1 | 27.8 | | | | | 11.0 | 14.9 | | | | 29.9 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.1 | | | | | 0.6 | 10.2 | | | | 0.7 | |
| Delay (s) | 29.9 | | | | | 11.6 | 25.1 | | | | 30.5 | |
| Level of Service | C | | | | | B | C | | | | C | |
| Approach Delay (s) | 29.9 | | | | | 11.6 | 25.1 | | | | 30.5 | |
| Approach LOS | C | | | | | B | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 21.9 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.71 | | | |
| Actuated Cycle Length (s) | 74.6 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 67.8% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 100 | 0 | 103 | 10 | 155 | 108 | 134 | 140 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 109 | 0 | 112 | 11 | 163 | 117 | 146 | 147 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 737 | 743 | 150 | 692 | 687 | 222 | 153 | | | 281 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 737 | 743 | 150 | 692 | 687 | 222 | 153 | | | 281 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 96 | 100 | 99 | 66 | 100 | 86 | 99 | | | 89 | | |
| cM capacity (veh/h) | 258 | 302 | 886 | 321 | 325 | 818 | 1428 | | | 1282 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 21 | 109 | 112 | 11 | 281 | 146 | 153 |
| Volume Left | 11 | 109 | 0 | 11 | 0 | 146 | 0 |
| Volume Right | 11 | 0 | 112 | 0 | 117 | 0 | 5 |
| cSH | 399 | 321 | 818 | 1428 | 1700 | 1282 | 1700 |
| Volume to Capacity | 0.05 | 0.34 | 0.14 | 0.01 | 0.17 | 0.11 | 0.09 |
| Queue Length 95th (ft) | 4 | 36 | 12 | 1 | 0 | 10 | 0 |
| Control Delay (s) | 14.5 | 21.8 | 10.1 | 7.5 | 0.0 | 8.2 | 0.0 |
| Lane LOS | B | C | B | A | | A | |
| Approach Delay (s) | 14.5 | 15.9 | | 0.3 | | 4.0 | |
| Approach LOS | B | C | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 6.1 | | | |
| Intersection Capacity Utilization | 42.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

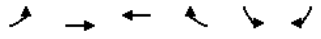
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 150 | 55 | 73 | 125 | 55 | 75 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 160 | 59 | 78 | 133 | 59 | 80 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 274 | 78 | | | 78 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 274 | 78 | | | 78 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 77 | 94 | | | 96 | |
| cM capacity (veh/h) | 690 | 986 | | | 1515 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 160 | 59 | 78 | 133 | 138 |
| Volume Left | 160 | 0 | 0 | 0 | 59 |
| Volume Right | 0 | 59 | 0 | 133 | 0 |
| cSH | 690 | 986 | 1700 | 1700 | 1515 |
| Volume to Capacity | 0.23 | 0.06 | 0.05 | 0.08 | 0.04 |
| Queue Length 95th (ft) | 22 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 11.8 | 8.9 | 0.0 | 0.0 | 3.3 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 11.0 | | 0.0 | | 3.3 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.0 | | |
| Intersection Capacity Utilization | 28.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 50 | 10 | 5 | 5 | 45 | 45 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 57 | 11 | 6 | 6 | 52 | 52 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 135 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 135 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 94 | 95 |
| cM capacity (veh/h) | 1595 | | | | 832 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 69 | 11 | 103 |
| Volume Left | 57 | 0 | 52 |
| Volume Right | 0 | 6 | 52 |
| cSH | 1595 | 1700 | 940 |
| Volume to Capacity | 0.04 | 0.01 | 0.11 |
| Queue Length 95th (ft) | 3 | 0 | 9 |
| Control Delay (s) | 6.2 | 0.0 | 9.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.2 | 0.0 | 9.3 |
| Approach LOS | | | A |

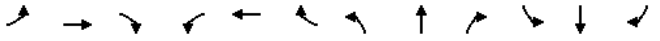
| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.5 | | |
| Intersection Capacity Utilization | 21.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 258 | 5 | 5 | 274 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 280 | 5 | 5 | 298 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 592 | 283 | | | 286 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 592 | 283 | | | 286 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 467 | 756 | | | 1276 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 286 | 303 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 577 | 1700 | 1276 |
| Volume to Capacity | 0.02 | 0.17 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 11.4 | 0.0 | 0.2 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.4 | 0.0 | 0.2 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 28.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2A
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009



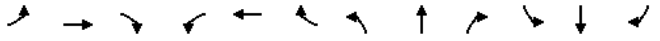
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 702 | 144 | 0 | 0 | 276 | 35 | 137 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 856 | 176 | 0 | 0 | 337 | 43 | 167 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 176 | | | 2246 | 2267 | 176 | 2252 | 2246 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 176 | | | 2246 | 2267 | 176 | 2252 | 2246 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1395 | | | 12 | 11 | 862 | 12 | 11 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 856 | 176 | 379 | 167 | 6 |
| Volume Left | 856 | 0 | 0 | 167 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 12 | 862 |
| Volume to Capacity | 0.73 | 0.10 | 0.22 | 14.16 | 0.01 |
| Queue Length 95th (ft) | 174 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.0 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.3 | | 0.0 | 9647.2 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1063.2 | | | |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2A
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 781 | 146 | 10 | 403 | 0 | 0 | 0 | 0 | 20 | 0 | 587 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 888 | 166 | 11 | 458 | 0 | 0 | 0 | 0 | 23 | 0 | 667 |
| RTOR Reduction (vph) | 0 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 888 | 53 | 11 | 458 | 0 | 0 | 0 | 0 | 23 | 312 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 35.1 | 6.8 | 1.2 | 29.5 | | | | | 15.5 | 15.5 | |
| Effective Green, g (s) | | 36.1 | 7.8 | 2.2 | 30.5 | | | | | 16.5 | 16.5 | |
| Actuated g/C Ratio | | 0.54 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 987 | 181 | 58 | 851 | | | | | 421 | 376 | |
| v/s Ratio Prot | | c0.49 | | 0.01 | 0.25 | | | | | | c0.20 | |
| v/s Ratio Perm | | | c0.03 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.90 | 0.29 | 0.19 | 0.54 | | | | | 0.05 | 0.83 | |
| Uniform Delay, d1 | | 13.7 | 27.0 | 31.4 | 13.1 | | | | | 19.2 | 23.8 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 10.9 | 0.9 | 1.6 | 0.7 | | | | | 0.1 | 14.0 | |
| Delay (s) | | 24.6 | 27.9 | 33.0 | 13.7 | | | | | 19.3 | 37.8 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 25.1 | | | 14.2 | | | 0.0 | | | 37.2 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 26.6 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.86 | | | |
| Actuated Cycle Length (s) | 66.8 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project AM Peak - Alt 2A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1797 | | 1719 | 1770 | | 1703 | 1607 | | 1770 | 1756 | |
| Flt Permitted | 0.10 | 1.00 | | 0.21 | 1.00 | | 0.71 | 1.00 | | 0.48 | 1.00 | |
| Satd. Flow (perm) | 179 | 1797 | | 372 | 1770 | | 1272 | 1607 | | 896 | 1756 | |
| Volume (vph) | 57 | 640 | 30 | 70 | 695 | 120 | 40 | 55 | 122 | 140 | 40 | 25 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 65 | 727 | 34 | 80 | 790 | 136 | 45 | 62 | 139 | 159 | 45 | 28 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 93 | 0 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 65 | 759 | 0 | 80 | 920 | 0 | 45 | 108 | 0 | 159 | 51 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.1 | 47.6 | | 52.1 | 47.6 | | 17.1 | 17.1 | | 17.1 | 17.1 | |
| Effective Green, g (s) | 54.1 | 48.6 | | 54.1 | 48.6 | | 18.1 | 18.1 | | 18.1 | 18.1 | |
| Actuated g/C Ratio | 0.64 | 0.58 | | 0.64 | 0.58 | | 0.21 | 0.21 | | 0.21 | 0.21 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 216 | 1037 | | 327 | 1022 | | 273 | 345 | | 193 | 377 | |
| v/s Ratio Prot | c0.02 | 0.42 | | 0.02 | c0.52 | | | 0.07 | | | 0.03 | |
| v/s Ratio Perm | 0.17 | | | 0.14 | | | 0.04 | | | c0.18 | | |
| v/c Ratio | 0.30 | 0.73 | | 0.24 | 0.90 | | 0.16 | 0.31 | | 0.82 | 0.14 | |
| Uniform Delay, d1 | 13.2 | 13.0 | | 8.9 | 15.7 | | 26.9 | 27.8 | | 31.5 | 26.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 2.7 | | 0.1 | 10.6 | | 0.3 | 0.5 | | 23.9 | 0.2 | |
| Delay (s) | 13.5 | 15.7 | | 9.1 | 26.2 | | 27.2 | 28.3 | | 55.4 | 26.9 | |
| Level of Service | B | B | | A | C | | C | C | | E | C | |
| Approach Delay (s) | | 15.6 | | | 24.9 | | | 28.1 | | | 46.4 | |
| Approach LOS | | B | | | C | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 24.0 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.84 | | | |
| Actuated Cycle Length (s) | 84.2 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.3% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project AM Peak - Alt 2A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 12 | 697 | 5 | 15 | 715 | 65 | 5 | 5 | 40 | 35 | 5 | 15 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 13 | 766 | 5 | 16 | 786 | 71 | 5 | 5 | 44 | 38 | 5 | 16 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 857 | | | 771 | | | 1633 | 1685 | 769 | 1693 | 1652 | 821 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 857 | | | 771 | | | 1633 | 1685 | 769 | 1693 | 1652 | 821 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 98 | | | 92 | 94 | 89 | 36 | 94 | 96 |
| cM capacity (veh/h) | 771 | | | 835 | | | 72 | 90 | 400 | 60 | 94 | 373 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 771 | 16 | 857 | 11 | 44 | 44 | 16 |
| Volume Left | 13 | 0 | 16 | 0 | 5 | 0 | 38 | 0 |
| Volume Right | 0 | 5 | 0 | 71 | 0 | 44 | 0 | 16 |
| cSH | 771 | 1700 | 835 | 1700 | 80 | 400 | 63 | 373 |
| Volume to Capacity | 0.02 | 0.45 | 0.02 | 0.50 | 0.14 | 0.11 | 0.70 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 2 | 0 | 11 | 9 | 76 | 3 |
| Control Delay (s) | 9.8 | 0.0 | 9.4 | 0.0 | 57.2 | 15.1 | 143.7 | 15.1 |
| Lane LOS | A | | A | | F | C | F | C |
| Approach Delay (s) | 0.2 | | 0.2 | | 23.5 | | 108.6 | |
| Approach LOS | | | | | C | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.6 | | | |
| Intersection Capacity Utilization | 58.2% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

2022 With Project AM Peak - Alt 2A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1723 | | 1736 | 1789 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.93 | | 0.55 | 1.00 | | 0.29 | 1.00 | |
| Satd. Flow (perm) | | 1509 | | | 1620 | | 1005 | 1789 | | 508 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 31 | 55 | 60 | 70 | 422 | 69 | 30 | 235 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 33 | 59 | 65 | 75 | 454 | 74 | 32 | 253 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 12 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 119 | 0 | 75 | 516 | 0 | 32 | 272 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 634 | | | 680 | | 422 | 751 | | 213 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.29 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.07 | | 0.07 | | | 0.06 | | |
| v/c Ratio | | 0.19 | | | 0.18 | | 0.18 | 0.69 | | 0.15 | 0.37 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 11.8 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.6 | | 0.9 | 5.1 | | 1.5 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.6 | | 10.0 | 16.9 | | 10.5 | 11.4 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.6 | | | 16.1 | | | 11.3 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.3 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 54.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

2022 With Project AM Peak - Alt 2A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1593 | | 1687 | 1634 | | 1770 | 1863 | 1583 | 1687 | 1760 | |
| Flt Permitted | 0.55 | 1.00 | | 0.52 | 1.00 | | 0.64 | 1.00 | 1.00 | 0.31 | 1.00 | |
| Satd. Flow (perm) | 895 | 1593 | | 928 | 1634 | | 1193 | 1863 | 1583 | 556 | 1760 | |
| Volume (vph) | 10 | 80 | 18 | 311 | 150 | 170 | 36 | 366 | 431 | 145 | 156 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 20 | 349 | 169 | 191 | 40 | 411 | 484 | 163 | 175 | 11 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 53 | 0 | 0 | 0 | 311 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 99 | 0 | 349 | 307 | 0 | 40 | 411 | 173 | 163 | 184 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.8 | 11.8 | | 26.7 | 20.7 | | 27.4 | 24.2 | 24.2 | 29.8 | 25.4 | |
| Effective Green, g (s) | 14.8 | 12.8 | | 27.7 | 21.7 | | 29.4 | 25.2 | 25.2 | 31.8 | 26.4 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.45 | 0.38 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 207 | 290 | | 483 | 504 | | 533 | 668 | 567 | 338 | 661 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.11 | 0.19 | | 0.00 | c0.22 | | c0.04 | 0.10 | |
| v/s Ratio Perm | 0.01 | | | c0.17 | | | 0.03 | | 0.11 | 0.18 | | |
| v/c Ratio | 0.05 | 0.34 | | 0.72 | 0.61 | | 0.08 | 0.62 | 0.31 | 0.48 | 0.28 | |
| Uniform Delay, d1 | 22.1 | 25.1 | | 16.5 | 20.7 | | 12.2 | 18.6 | 16.2 | 12.6 | 15.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 5.3 | 2.1 | | 0.1 | 4.2 | 1.4 | 1.1 | 1.0 | |
| Delay (s) | 22.2 | 25.8 | | 21.8 | 22.8 | | 12.2 | 22.8 | 17.6 | 13.7 | 16.3 | |
| Level of Service | C | C | | C | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.4 | | | 22.3 | | | 19.7 | | | 15.1 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 20.1 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.65 | | | |
| Actuated Cycle Length (s) | 70.3 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 61.2% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2A
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.91 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1782 | | | | | 1808 | 1639 | | | | 1604 | |
| Flt Permitted | 0.95 | | | | | 0.91 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1782 | | | | | 1639 | 1639 | | | | 1604 | |
| Volume (vph) | 205 | 7 | 5 | 5 | 7 | 453 | 155 | 65 | 245 | 5 | 215 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 9 | 6 | 6 | 9 | 588 | 201 | 84 | 258 | 5 | 226 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 281 | 0 | 0 | 0 | 0 | 603 | 502 | 0 | 0 | 0 | 247 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 14.5 | | | | | 24.3 | 24.3 | | | | 14.3 | |
| Effective Green, g (s) | 15.5 | | | | | 25.3 | 25.3 | | | | 15.3 | |
| Actuated g/C Ratio | 0.23 | | | | | 0.37 | 0.37 | | | | 0.22 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 406 | | | | | 609 | 609 | | | | 360 | |
| v/s Ratio Prot | c0.16 | | | | | | 0.31 | | | | c0.15 | |
| v/s Ratio Perm | | | | | | c0.37 | | | | | | |
| v/c Ratio | 0.69 | | | | | 0.99 | 0.82 | | | | 0.69 | |
| Uniform Delay, d1 | 24.1 | | | | | 21.3 | 19.4 | | | | 24.2 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 5.0 | | | | | 33.8 | 12.1 | | | | 5.4 | |
| Delay (s) | 29.2 | | | | | 55.1 | 31.4 | | | | 29.6 | |
| Level of Service | C | | | | | E | C | | | | C | |
| Approach Delay (s) | 29.2 | | | | | 55.1 | 31.4 | | | | 29.6 | |
| Approach LOS | C | | | | | E | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 39.3 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.83 | | | |
| Actuated Cycle Length (s) | 68.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 69.0% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2A
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 29 | 0 | 195 | 5 | 150 | 6 | 42 | 90 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 32 | 0 | 212 | 6 | 192 | 7 | 46 | 115 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 627 | 422 | 119 | 421 | 421 | 196 | 122 | | | 199 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 627 | 422 | 119 | 421 | 421 | 196 | 122 | | | 199 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 98 | 100 | 99 | 94 | 100 | 75 | 100 | | | 97 | | |
| cM capacity (veh/h) | 290 | 504 | 939 | 523 | 504 | 846 | 1441 | | | 1374 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 32 | 212 | 6 | 199 | 46 | 122 |
| Volume Left | 6 | 32 | 0 | 6 | 0 | 46 | 0 |
| Volume Right | 6 | 0 | 212 | 0 | 7 | 0 | 6 |
| cSH | 444 | 523 | 846 | 1441 | 1700 | 1374 | 1700 |
| Volume to Capacity | 0.03 | 0.06 | 0.25 | 0.00 | 0.12 | 0.03 | 0.07 |
| Queue Length 95th (ft) | 2 | 5 | 25 | 0 | 0 | 3 | 0 |
| Control Delay (s) | 13.4 | 12.3 | 10.7 | 7.5 | 0.0 | 7.7 | 0.0 |
| Lane LOS | B | B | B | A | | A | |
| Approach Delay (s) | 13.4 | 10.9 | | 0.2 | | 2.1 | |
| Approach LOS | B | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 5.1 | | | |
| Intersection Capacity Utilization | 33.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

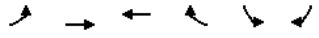
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 115 | 60 | 26 | 70 | 47 | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 125 | 65 | 28 | 76 | 51 | 35 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 165 | 28 | | | 28 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 165 | 28 | | | 28 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 84 | 94 | | | 97 | |
| cM capacity (veh/h) | 791 | 1038 | | | 1535 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 125 | 65 | 28 | 76 | 86 |
| Volume Left | 125 | 0 | 0 | 0 | 51 |
| Volume Right | 0 | 65 | 0 | 76 | 0 |
| cSH | 791 | 1038 | 1700 | 1700 | 1535 |
| Volume to Capacity | 0.16 | 0.06 | 0.02 | 0.04 | 0.03 |
| Queue Length 95th (ft) | 14 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 10.4 | 8.7 | 0.0 | 0.0 | 4.5 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.8 | | 0.0 | | 4.5 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 77 | 5 | 5 | 35 | 5 | 30 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 92 | 6 | 6 | 42 | 6 | 36 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 216 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 216 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 94 | | | | 99 | 97 |
| cM capacity (veh/h) | 1573 | | | | 715 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 98 | 48 | 42 |
| Volume Left | 92 | 0 | 6 |
| Volume Right | 0 | 42 | 36 |
| cSH | 1573 | 1700 | 970 |
| Volume to Capacity | 0.06 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 5 | 0 | 3 |
| Control Delay (s) | 7.0 | 0.0 | 8.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 7.0 | 0.0 | 8.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.6 | | |
| Intersection Capacity Utilization | 21.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 350 | 5 | 5 | 132 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 380 | 5 | 5 | 143 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 538 | 383 | | | 386 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 538 | 383 | | | 386 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 100 | |
| cM capacity (veh/h) | 502 | 664 | | | 1173 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 386 | 149 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 572 | 1700 | 1173 |
| Volume to Capacity | 0.02 | 0.23 | 0.00 |
| Queue Length 95th (ft) | 1 | 0 | 0 |
| Control Delay (s) | 11.4 | 0.0 | 0.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.4 | 0.0 | 0.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 28.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2A
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 841 | 343 | 0 | 0 | 229 | 55 | 216 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 904 | 369 | 0 | 0 | 246 | 59 | 232 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 305 | | | 369 | | | 2453 | 2483 | 369 | 2475 | 2453 | 276 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 305 | | | 369 | | | 2453 | 2483 | 369 | 2475 | 2453 | 276 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 28 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1255 | | | 1195 | | | 9 | 8 | 677 | 8 | 9 | 768 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 904 | 369 | 305 | 232 | 22 |
| Volume Left | 904 | 0 | 0 | 232 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1255 | 1700 | 1700 | 9 | 677 |
| Volume to Capacity | 0.72 | 0.22 | 0.18 | 26.62 | 0.03 |
| Queue Length 95th (ft) | 168 | 0 | 0 | Err | 2 |
| Control Delay (s) | 14.9 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | B | | | F | B |
| Approach Delay (s) | 10.6 | | 0.0 | 9152.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1274.9 | | | |
| Intersection Capacity Utilization | 135.8% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2A
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.17 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 316 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1009 | 195 | 20 | 395 | 0 | 0 | 0 | 0 | 80 | 0 | 853 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1040 | 201 | 21 | 407 | 0 | 0 | 0 | 0 | 82 | 0 | 879 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1040 | 66 | 21 | 407 | 0 | 0 | 0 | 0 | 82 | 442 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.4 | 8.6 | 22.8 | 22.8 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 37.4 | 9.6 | 23.8 | 23.8 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1099 | 240 | 119 | 706 | | | | | 503 | 449 | |
| v/s Ratio Prot | | c0.56 | 0.04 | | 0.22 | | | | | | c0.28 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.28 | 0.18 | 0.58 | | | | | 0.16 | 0.98 | |
| Uniform Delay, d1 | | 12.1 | 23.8 | 13.2 | 15.8 | | | | | 17.0 | 22.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 15.8 | 0.6 | 0.7 | 1.1 | | | | | 0.2 | 38.2 | |
| Delay (s) | | 27.9 | 24.4 | 14.0 | 16.9 | | | | | 17.2 | 60.8 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 27.3 | | | 16.8 | | | 0.0 | | | 57.0 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 36.5 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.96 | | | |
| Actuated Cycle Length (s) | 63.4 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 135.8% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project PM Peak - Alt 2A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1845 | | 1770 | 1840 | | 1787 | 1688 | | 1770 | 1707 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.59 | 1.00 | |
| Satd. Flow (perm) | 151 | 1845 | | 151 | 1840 | | 1062 | 1688 | | 1094 | 1707 | |
| Volume (vph) | 80 | 839 | 55 | 112 | 906 | 80 | 55 | 46 | 100 | 230 | 70 | 87 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 85 | 893 | 59 | 119 | 964 | 85 | 59 | 49 | 106 | 245 | 74 | 93 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 80 | 0 | 0 | 51 | 0 |
| Lane Group Flow (vph) | 85 | 949 | 0 | 119 | 1045 | 0 | 59 | 75 | 0 | 245 | 116 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.8 | 48.2 | | 52.8 | 48.2 | | 20.2 | 20.2 | | 20.2 | 20.2 | |
| Effective Green, g (s) | 54.8 | 49.2 | | 54.8 | 49.2 | | 21.2 | 21.2 | | 21.2 | 21.2 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.62 | 0.56 | | 0.24 | 0.24 | | 0.24 | 0.24 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 197 | 1032 | | 197 | 1029 | | 256 | 407 | | 264 | 411 | |
| v/s Ratio Prot | 0.03 | 0.51 | | c0.04 | c0.57 | | | 0.04 | | | 0.07 | |
| v/s Ratio Perm | 0.24 | | | 0.34 | | | 0.06 | | | c0.22 | | |
| v/c Ratio | 0.43 | 0.92 | | 0.60 | 1.02 | | 0.23 | 0.18 | | 0.93 | 0.28 | |
| Uniform Delay, d1 | 20.3 | 17.6 | | 17.2 | 19.4 | | 26.8 | 26.5 | | 32.7 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 12.7 | | 3.6 | 32.1 | | 0.5 | 0.2 | | 36.2 | 0.4 | |
| Delay (s) | 20.9 | 30.3 | | 20.8 | 51.5 | | 27.3 | 26.7 | | 68.9 | 27.6 | |
| Level of Service | C | C | | C | D | | C | C | | E | C | |
| Approach Delay (s) | | 29.5 | | | 48.4 | | | 26.9 | | | 52.1 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 40.4 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.96 | | | |
| Actuated Cycle Length (s) | 88.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 92.2% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project PM Peak - Alt 2A
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 959 | 10 | 30 | 978 | 50 | 10 | 5 | 20 | 55 | 5 | 17 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 11 | 979 | 10 | 31 | 998 | 51 | 10 | 5 | 20 | 56 | 5 | 17 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1049 | | | 989 | | | 2085 | 2116 | 984 | 2109 | 2096 | 1023 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1049 | | | 989 | | | 2085 | 2116 | 984 | 2109 | 2096 | 1023 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 96 | | | 68 | 89 | 93 | 0 | 90 | 94 |
| cM capacity (veh/h) | 663 | | | 703 | | | 32 | 47 | 300 | 31 | 50 | 289 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 989 | 31 | 1049 | 15 | 20 | 61 | 17 |
| Volume Left | 11 | 0 | 31 | 0 | 10 | 0 | 56 | 0 |
| Volume Right | 0 | 10 | 0 | 51 | 0 | 20 | 0 | 17 |
| cSH | 663 | 1700 | 703 | 1700 | 36 | 300 | 32 | 289 |
| Volume to Capacity | 0.02 | 0.58 | 0.04 | 0.62 | 0.43 | 0.07 | 1.92 | 0.06 |
| Queue Length 95th (ft) | 1 | 0 | 3 | 0 | 36 | 5 | 174 | 5 |
| Control Delay (s) | 10.5 | 0.0 | 10.4 | 0.0 | 166.7 | 17.9 | 699.6 | 18.3 |
| Lane LOS | B | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 0.3 | | 81.6 | | 549.1 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 21.2 | | | |
| Intersection Capacity Utilization | 71.2% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1849 | | 1805 | 1880 | |
| Flt Permitted | | 0.78 | | | 0.83 | | 0.17 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | | 1424 | | | 1493 | | 323 | 1849 | | 608 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 73 | 100 | 65 | 90 | 387 | 84 | 120 | 580 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 80 | 110 | 71 | 99 | 425 | 92 | 132 | 637 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 25 | 0 | 0 | 14 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 236 | 0 | 99 | 503 | 0 | 132 | 681 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 570 | | | 597 | | 147 | 840 | | 276 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.27 | | | c0.36 | |
| v/s Ratio Perm | | c0.23 | | | 0.16 | | 0.31 | | | 0.22 | | |
| v/c Ratio | | 0.56 | | | 0.40 | | 0.67 | 0.60 | | 0.48 | 0.80 | |
| Uniform Delay, d1 | | 12.8 | | | 11.8 | | 11.8 | 11.2 | | 10.5 | 12.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.0 | | | 2.0 | | 22.0 | 3.1 | | 5.8 | 7.6 | |
| Delay (s) | | 16.8 | | | 13.7 | | 33.8 | 14.4 | | 16.3 | 20.4 | |
| Level of Service | | B | | | B | | C | B | | B | C | |
| Approach Delay (s) | | 16.8 | | | 13.7 | | | 17.5 | | | 19.8 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 17.8 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.69 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 74.6% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1744 | | 1787 | 1689 | | 1805 | 1900 | 1615 | 1787 | 1868 | |
| Flt Permitted | 0.36 | 1.00 | | 0.41 | 1.00 | | 0.37 | 1.00 | 1.00 | 0.37 | 1.00 | |
| Satd. Flow (perm) | 653 | 1744 | | 768 | 1689 | | 699 | 1900 | 1615 | 698 | 1868 | |
| Volume (vph) | 10 | 160 | 35 | 363 | 120 | 255 | 33 | 291 | 251 | 295 | 423 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 38 | 390 | 129 | 274 | 35 | 313 | 270 | 317 | 455 | 22 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 94 | 0 | 0 | 0 | 177 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 199 | 0 | 390 | 309 | 0 | 35 | 313 | 93 | 317 | 475 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 18.9 | 17.8 | | 29.8 | 23.7 | | 28.4 | 26.2 | 26.2 | 39.2 | 32.0 | |
| Effective Green, g (s) | 20.9 | 18.8 | | 30.8 | 24.7 | | 30.4 | 27.2 | 27.2 | 40.2 | 33.0 | |
| Actuated g/C Ratio | 0.26 | 0.24 | | 0.39 | 0.31 | | 0.38 | 0.34 | 0.34 | 0.51 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 201 | 415 | | 403 | 528 | | 314 | 654 | 556 | 479 | 780 | |
| v/s Ratio Prot | 0.00 | 0.11 | | c0.10 | 0.18 | | 0.00 | 0.16 | | c0.08 | 0.25 | |
| v/s Ratio Perm | 0.01 | | | c0.28 | | | 0.04 | | 0.06 | c0.26 | | |
| v/c Ratio | 0.05 | 0.48 | | 0.97 | 0.58 | | 0.11 | 0.48 | 0.17 | 0.66 | 0.61 | |
| Uniform Delay, d1 | 21.7 | 25.9 | | 22.9 | 22.8 | | 15.5 | 20.3 | 18.0 | 12.7 | 18.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 36.0 | 1.7 | | 0.2 | 2.5 | 0.6 | 3.4 | 3.5 | |
| Delay (s) | 21.8 | 26.8 | | 58.9 | 24.5 | | 15.7 | 22.8 | 18.7 | 16.1 | 21.5 | |
| Level of Service | C | C | | E | C | | B | C | B | B | C | |
| Approach Delay (s) | | 26.5 | | | 41.4 | | | 20.6 | | | 19.3 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 27.5 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.77 | | | |
| Actuated Cycle Length (s) | 79.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 75.7% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2A
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.95 | | | | 0.99 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1780 | | | | | 1861 | 1792 | | | | 1800 | |
| Flt Permitted | 0.96 | | | | | 0.57 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1780 | | | | | 1065 | 1792 | | | | 1800 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 455 | 606 | 75 | 255 | 5 | 150 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 495 | 659 | 82 | 277 | 5 | 163 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 180 | 0 | 0 | 0 | 0 | 507 | 1005 | 0 | 0 | 0 | 177 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.9 | | | | | 39.3 | 39.3 | | | | 12.7 | |
| Effective Green, g (s) | 13.9 | | | | | 40.3 | 40.3 | | | | 13.7 | |
| Actuated g/C Ratio | 0.17 | | | | | 0.50 | 0.50 | | | | 0.17 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 310 | | | | | 537 | 904 | | | | 309 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.56 | | | | c0.10 | |
| v/s Ratio Perm | | | | | | 0.48 | | | | | | |
| v/c Ratio | 0.58 | | | | | 0.94 | 1.11 | | | | 0.57 | |
| Uniform Delay, d1 | 30.3 | | | | | 18.7 | 19.8 | | | | 30.4 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.8 | | | | | 25.4 | 65.3 | | | | 2.5 | |
| Delay (s) | 33.1 | | | | | 44.2 | 85.1 | | | | 32.9 | |
| Level of Service | C | | | | | D | F | | | | C | |
| Approach Delay (s) | 33.1 | | | | | 44.2 | 85.1 | | | | 32.9 | |
| Approach LOS | C | | | | | D | F | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 64.2 | HCM Level of Service | E | |
| HCM Volume to Capacity ratio | 0.89 | | | |
| Actuated Cycle Length (s) | 79.9 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.5% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2A
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 14 | 0 | 93 | 10 | 230 | 28 | 187 | 205 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 15 | 0 | 101 | 11 | 242 | 30 | 203 | 216 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 989 | 919 | 218 | 911 | 906 | 257 | 221 | | | 273 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 989 | 919 | 218 | 911 | 906 | 257 | 221 | | | 273 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 94 | 100 | 99 | 93 | 100 | 87 | 99 | | | 84 | | |
| cM capacity (veh/h) | 169 | 227 | 811 | 220 | 231 | 781 | 1348 | | | 1291 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 21 | 15 | 101 | 11 | 273 | 203 | 221 |
| Volume Left | 11 | 15 | 0 | 11 | 0 | 203 | 0 |
| Volume Right | 11 | 0 | 101 | 0 | 30 | 0 | 5 |
| cSH | 279 | 220 | 781 | 1348 | 1700 | 1291 | 1700 |
| Volume to Capacity | 0.08 | 0.07 | 0.13 | 0.01 | 0.16 | 0.16 | 0.13 |
| Queue Length 95th (ft) | 6 | 6 | 11 | 1 | 0 | 14 | 0 |
| Control Delay (s) | 18.9 | 22.6 | 10.3 | 7.7 | 0.0 | 8.3 | 0.0 |
| Lane LOS | C | C | B | A | | A | |
| Approach Delay (s) | 18.9 | 11.9 | | 0.3 | | 4.0 | |
| Approach LOS | C | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.2 | | | |
| Intersection Capacity Utilization | 42.0% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

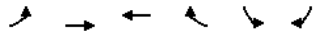
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 180 | 77 | 46 | 150 | 66 | 43 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 191 | 82 | 49 | 160 | 70 | 46 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 235 | 49 | | | 49 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 235 | 49 | | | 49 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 73 | 92 | | | 95 | |
| cM capacity (veh/h) | 721 | 1023 | | | 1552 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 191 | 82 | 49 | 160 | 116 |
| Volume Left | 191 | 0 | 0 | 0 | 70 |
| Volume Right | 0 | 82 | 0 | 160 | 0 |
| cSH | 721 | 1023 | 1700 | 1700 | 1552 |
| Volume to Capacity | 0.27 | 0.08 | 0.03 | 0.09 | 0.05 |
| Queue Length 95th (ft) | 27 | 7 | 0 | 0 | 4 |
| Control Delay (s) | 11.8 | 8.8 | 0.0 | 0.0 | 4.6 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 10.9 | | 0.0 | | 4.6 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 29.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 61 | 10 | 5 | 5 | 45 | 67 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 70 | 11 | 6 | 6 | 52 | 77 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 160 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 160 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 94 | 93 |
| cM capacity (veh/h) | 1595 | | | | 799 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 82 | 11 | 129 |
| Volume Left | 70 | 0 | 52 |
| Volume Right | 0 | 6 | 77 |
| cSH | 1595 | 1700 | 946 |
| Volume to Capacity | 0.04 | 0.01 | 0.14 |
| Queue Length 95th (ft) | 3 | 0 | 12 |
| Control Delay (s) | 6.4 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.4 | 0.0 | 9.4 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.8 | | |
| Intersection Capacity Utilization | 23.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 5 | 323 | 5 | 5 | 392 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 5 | 351 | 5 | 5 | 426 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 791 | 354 | | | 357 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 791 | 354 | | | 357 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 99 | | | 100 | |
| cM capacity (veh/h) | 357 | 690 | | | 1202 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 11 | 357 | 432 |
| Volume Left | 5 | 0 | 5 |
| Volume Right | 5 | 5 | 0 |
| cSH | 471 | 1700 | 1202 |
| Volume to Capacity | 0.02 | 0.21 | 0.00 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 12.8 | 0.0 | 0.1 |
| Lane LOS | B | | A |
| Approach Delay (s) | 12.8 | 0.0 | 0.1 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 34.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2F
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 702 | 144 | 0 | 0 | 276 | 35 | 137 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 856 | 176 | 0 | 0 | 337 | 43 | 167 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 176 | | | 2246 | 2267 | 176 | 2252 | 2246 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 176 | | | 2246 | 2267 | 176 | 2252 | 2246 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1395 | | | 12 | 11 | 862 | 12 | 11 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 856 | 176 | 379 | 167 | 6 |
| Volume Left | 856 | 0 | 0 | 167 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 12 | 862 |
| Volume to Capacity | 0.73 | 0.10 | 0.22 | 14.16 | 0.01 |
| Queue Length 95th (ft) | 174 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.0 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.3 | | 0.0 | 9647.2 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1063.2 | | | |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2F
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 781 | 146 | 10 | 403 | 0 | 0 | 0 | 0 | 20 | 0 | 587 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 888 | 166 | 11 | 458 | 0 | 0 | 0 | 0 | 23 | 0 | 667 |
| RTOR Reduction (vph) | 0 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 888 | 53 | 11 | 458 | 0 | 0 | 0 | 0 | 23 | 312 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 35.1 | 6.8 | 1.2 | 29.5 | | | | | 15.5 | 15.5 | |
| Effective Green, g (s) | | 36.1 | 7.8 | 2.2 | 30.5 | | | | | 16.5 | 16.5 | |
| Actuated g/C Ratio | | 0.54 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 987 | 181 | 58 | 851 | | | | | 421 | 376 | |
| v/s Ratio Prot | | c0.49 | | 0.01 | 0.25 | | | | | | c0.20 | |
| v/s Ratio Perm | | | c0.03 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.90 | 0.29 | 0.19 | 0.54 | | | | | 0.05 | 0.83 | |
| Uniform Delay, d1 | | 13.7 | 27.0 | 31.4 | 13.1 | | | | | 19.2 | 23.8 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 10.9 | 0.9 | 1.6 | 0.7 | | | | | 0.1 | 14.0 | |
| Delay (s) | | 24.6 | 27.9 | 33.0 | 13.7 | | | | | 19.3 | 37.8 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 25.1 | | | 14.2 | | | 0.0 | | | 37.2 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 26.6 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.86 | | | |
| Actuated Cycle Length (s) | 66.8 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project AM Peak - Alt 2F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1797 | | 1719 | 1770 | | 1703 | 1607 | | 1770 | 1756 | |
| Flt Permitted | 0.10 | 1.00 | | 0.21 | 1.00 | | 0.71 | 1.00 | | 0.48 | 1.00 | |
| Satd. Flow (perm) | 179 | 1797 | | 372 | 1770 | | 1272 | 1607 | | 896 | 1756 | |
| Volume (vph) | 57 | 640 | 30 | 70 | 695 | 120 | 40 | 55 | 122 | 140 | 40 | 25 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 65 | 727 | 34 | 80 | 790 | 136 | 45 | 62 | 139 | 159 | 45 | 28 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 93 | 0 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 65 | 759 | 0 | 80 | 920 | 0 | 45 | 108 | 0 | 159 | 51 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.1 | 47.6 | | 52.1 | 47.6 | | 17.1 | 17.1 | | 17.1 | 17.1 | |
| Effective Green, g (s) | 54.1 | 48.6 | | 54.1 | 48.6 | | 18.1 | 18.1 | | 18.1 | 18.1 | |
| Actuated g/C Ratio | 0.64 | 0.58 | | 0.64 | 0.58 | | 0.21 | 0.21 | | 0.21 | 0.21 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 216 | 1037 | | 327 | 1022 | | 273 | 345 | | 193 | 377 | |
| v/s Ratio Prot | c0.02 | 0.42 | | 0.02 | c0.52 | | | 0.07 | | | 0.03 | |
| v/s Ratio Perm | 0.17 | | | 0.14 | | | 0.04 | | | c0.18 | | |
| v/c Ratio | 0.30 | 0.73 | | 0.24 | 0.90 | | 0.16 | 0.31 | | 0.82 | 0.14 | |
| Uniform Delay, d1 | 13.2 | 13.0 | | 8.9 | 15.7 | | 26.9 | 27.8 | | 31.5 | 26.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 2.7 | | 0.1 | 10.6 | | 0.3 | 0.5 | | 23.9 | 0.2 | |
| Delay (s) | 13.5 | 15.7 | | 9.1 | 26.2 | | 27.2 | 28.3 | | 55.4 | 26.9 | |
| Level of Service | B | B | | A | C | | C | C | | E | C | |
| Approach Delay (s) | | 15.6 | | | 24.9 | | | 28.1 | | | 46.4 | |
| Approach LOS | | B | | | C | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 24.0 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.84 | | | |
| Actuated Cycle Length (s) | 84.2 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.3% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project AM Peak - Alt 2F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 12 | 697 | 5 | 15 | 715 | 65 | 5 | 5 | 40 | 35 | 5 | 15 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 13 | 766 | 5 | 16 | 786 | 71 | 5 | 5 | 44 | 38 | 5 | 16 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 857 | | | 771 | | | 1633 | 1685 | 769 | 1693 | 1652 | 821 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 857 | | | 771 | | | 1633 | 1685 | 769 | 1693 | 1652 | 821 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 98 | | | 92 | 94 | 89 | 36 | 94 | 96 |
| cM capacity (veh/h) | 771 | | | 835 | | | 72 | 90 | 400 | 60 | 94 | 373 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 771 | 16 | 857 | 11 | 44 | 44 | 16 |
| Volume Left | 13 | 0 | 16 | 0 | 5 | 0 | 38 | 0 |
| Volume Right | 0 | 5 | 0 | 71 | 0 | 44 | 0 | 16 |
| cSH | 771 | 1700 | 835 | 1700 | 80 | 400 | 63 | 373 |
| Volume to Capacity | 0.02 | 0.45 | 0.02 | 0.50 | 0.14 | 0.11 | 0.70 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 2 | 0 | 11 | 9 | 76 | 3 |
| Control Delay (s) | 9.8 | 0.0 | 9.4 | 0.0 | 57.2 | 15.1 | 143.7 | 15.1 |
| Lane LOS | A | | A | | F | C | F | C |
| Approach Delay (s) | 0.2 | | 0.2 | | 23.5 | | 108.6 | |
| Approach LOS | | | | | C | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.6 | | | |
| Intersection Capacity Utilization | 58.2% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2F
5: Harris Ave & 12th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1723 | | 1736 | 1789 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.93 | | 0.55 | 1.00 | | 0.29 | 1.00 | |
| Satd. Flow (perm) | | 1509 | | | 1620 | | 1005 | 1789 | | 508 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 31 | 55 | 60 | 70 | 422 | 69 | 30 | 235 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 33 | 59 | 65 | 75 | 454 | 74 | 32 | 253 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 12 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 119 | 0 | 75 | 516 | 0 | 32 | 272 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 634 | | | 680 | | 422 | 751 | | 213 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.29 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.07 | | 0.07 | | | 0.06 | | |
| v/c Ratio | | 0.19 | | | 0.18 | | 0.18 | 0.69 | | 0.15 | 0.37 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 11.8 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.6 | | 0.9 | 5.1 | | 1.5 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.6 | | 10.0 | 16.9 | | 10.5 | 11.4 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.6 | | | 16.1 | | | 11.3 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.3 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 54.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2F
6: Old Fairhaven Pkwy & 12th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1593 | | 1687 | 1634 | | 1770 | 1863 | 1583 | 1687 | 1760 | |
| Flt Permitted | 0.55 | 1.00 | | 0.52 | 1.00 | | 0.64 | 1.00 | 1.00 | 0.31 | 1.00 | |
| Satd. Flow (perm) | 895 | 1593 | | 928 | 1634 | | 1193 | 1863 | 1583 | 556 | 1760 | |
| Volume (vph) | 10 | 80 | 18 | 311 | 150 | 170 | 36 | 366 | 431 | 145 | 156 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 20 | 349 | 169 | 191 | 40 | 411 | 484 | 163 | 175 | 11 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 53 | 0 | 0 | 0 | 311 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 99 | 0 | 349 | 307 | 0 | 40 | 411 | 173 | 163 | 184 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.8 | 11.8 | | 26.7 | 20.7 | | 27.4 | 24.2 | 24.2 | 29.8 | 25.4 | |
| Effective Green, g (s) | 14.8 | 12.8 | | 27.7 | 21.7 | | 29.4 | 25.2 | 25.2 | 31.8 | 26.4 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.45 | 0.38 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 207 | 290 | | 483 | 504 | | 533 | 668 | 567 | 338 | 661 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.11 | 0.19 | | 0.00 | c0.22 | | c0.04 | 0.10 | |
| v/s Ratio Perm | 0.01 | | | c0.17 | | | 0.03 | | 0.11 | 0.18 | | |
| v/c Ratio | 0.05 | 0.34 | | 0.72 | 0.61 | | 0.08 | 0.62 | 0.31 | 0.48 | 0.28 | |
| Uniform Delay, d1 | 22.1 | 25.1 | | 16.5 | 20.7 | | 12.2 | 18.6 | 16.2 | 12.6 | 15.3 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 5.3 | 2.1 | | 0.1 | 4.2 | 1.4 | 1.1 | 1.0 | |
| Delay (s) | 22.2 | 25.8 | | 21.8 | 22.8 | | 12.2 | 22.8 | 17.6 | 13.7 | 16.3 | |
| Level of Service | C | C | | C | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.4 | | | 22.3 | | | 19.7 | | | 15.1 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 20.1 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.65 | | | |
| Actuated Cycle Length (s) | 70.3 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 61.2% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2F
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.91 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1782 | | | | | 1808 | 1639 | | | | 1604 | |
| Flt Permitted | 0.95 | | | | | 0.91 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1782 | | | | | 1639 | 1639 | | | | 1604 | |
| Volume (vph) | 205 | 7 | 5 | 5 | 7 | 453 | 155 | 65 | 245 | 5 | 215 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 9 | 6 | 6 | 9 | 588 | 201 | 84 | 258 | 5 | 226 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 281 | 0 | 0 | 0 | 0 | 603 | 502 | 0 | 0 | 0 | 247 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 14.5 | | | | | 24.3 | 24.3 | | | | 14.3 | |
| Effective Green, g (s) | 15.5 | | | | | 25.3 | 25.3 | | | | 15.3 | |
| Actuated g/C Ratio | 0.23 | | | | | 0.37 | 0.37 | | | | 0.22 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 406 | | | | | 609 | 609 | | | | 360 | |
| v/s Ratio Prot | c0.16 | | | | | | 0.31 | | | | c0.15 | |
| v/s Ratio Perm | | | | | | c0.37 | | | | | | |
| v/c Ratio | 0.69 | | | | | 0.99 | 0.82 | | | | 0.69 | |
| Uniform Delay, d1 | 24.1 | | | | | 21.3 | 19.4 | | | | 24.2 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 5.0 | | | | | 33.8 | 12.1 | | | | 5.4 | |
| Delay (s) | 29.2 | | | | | 55.1 | 31.4 | | | | 29.6 | |
| Level of Service | C | | | | | E | C | | | | C | |
| Approach Delay (s) | 29.2 | | | | | 55.1 | 31.4 | | | | 29.6 | |
| Approach LOS | C | | | | | E | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 39.3 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.83 | | | |
| Actuated Cycle Length (s) | 68.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 69.0% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 2F
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 10 | 0 | 64 | 5 | 154 | 2 | 14 | 109 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 11 | 0 | 70 | 6 | 197 | 2 | 15 | 140 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 453 | 386 | 143 | 388 | 388 | 199 | 146 | | | 200 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 453 | 386 | 143 | 388 | 388 | 199 | 146 | | | 200 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 99 | 100 | 99 | 98 | 100 | 92 | 100 | | | 99 | | |
| cM capacity (veh/h) | 472 | 540 | 910 | 560 | 538 | 843 | 1412 | | | 1373 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 11 | 70 | 6 | 200 | 15 | 146 |
| Volume Left | 6 | 11 | 0 | 6 | 0 | 15 | 0 |
| Volume Right | 6 | 0 | 70 | 0 | 2 | 0 | 6 |
| cSH | 621 | 560 | 843 | 1412 | 1700 | 1373 | 1700 |
| Volume to Capacity | 0.02 | 0.02 | 0.08 | 0.00 | 0.12 | 0.01 | 0.09 |
| Queue Length 95th (ft) | 2 | 1 | 7 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 10.9 | 11.6 | 9.7 | 7.6 | 0.0 | 7.7 | 0.0 |
| Lane LOS | B | B | A | A | | A | |
| Approach Delay (s) | 10.9 | 9.9 | | 0.2 | | 0.7 | |
| Approach LOS | B | A | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.4 | | | |
| Intersection Capacity Utilization | 25.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

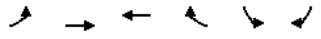
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 115 | 60 | 26 | 70 | 47 | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 125 | 65 | 28 | 76 | 51 | 35 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 165 | 28 | | | 28 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 165 | 28 | | | 28 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 84 | 94 | | | 97 | |
| cM capacity (veh/h) | 791 | 1038 | | | 1535 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 125 | 65 | 28 | 76 | 86 |
| Volume Left | 125 | 0 | 0 | 0 | 51 |
| Volume Right | 0 | 65 | 0 | 76 | 0 |
| cSH | 791 | 1038 | 1700 | 1700 | 1535 |
| Volume to Capacity | 0.16 | 0.06 | 0.02 | 0.04 | 0.03 |
| Queue Length 95th (ft) | 14 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 10.4 | 8.7 | 0.0 | 0.0 | 4.5 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.8 | | 0.0 | | 4.5 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 77 | 5 | 5 | 35 | 5 | 30 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 92 | 6 | 6 | 42 | 6 | 36 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 216 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 216 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 94 | | | | 99 | 97 |
| cM capacity (veh/h) | 1573 | | | | 715 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 98 | 48 | 42 |
| Volume Left | 92 | 0 | 6 |
| Volume Right | 0 | 42 | 36 |
| cSH | 1573 | 1700 | 970 |
| Volume to Capacity | 0.06 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 5 | 0 | 3 |
| Control Delay (s) | 7.0 | 0.0 | 8.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 7.0 | 0.0 | 8.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.6 | | |
| Intersection Capacity Utilization | 21.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 24 | 136 | 219 | 9 | 33 | 104 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 26 | 148 | 238 | 10 | 36 | 113 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 428 | 243 | | | 248 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 428 | 243 | | | 248 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 95 | 81 | | | 97 | |
| cM capacity (veh/h) | 568 | 796 | | | 1318 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 174 | 248 | 149 |
| Volume Left | 26 | 0 | 36 |
| Volume Right | 148 | 10 | 0 |
| cSH | 751 | 1700 | 1318 |
| Volume to Capacity | 0.23 | 0.15 | 0.03 |
| Queue Length 95th (ft) | 22 | 0 | 2 |
| Control Delay (s) | 11.2 | 0.0 | 2.1 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.2 | 0.0 | 2.1 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.0 | | |
| Intersection Capacity Utilization | 39.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2F
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 841 | 343 | 0 | 0 | 229 | 55 | 216 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 904 | 369 | 0 | 0 | 246 | 59 | 232 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 305 | | | 369 | | | 2453 | 2483 | 369 | 2475 | 2453 | 276 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 305 | | | 369 | | | 2453 | 2483 | 369 | 2475 | 2453 | 276 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 28 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1255 | | | 1195 | | | 9 | 8 | 677 | 8 | 9 | 768 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 904 | 369 | 305 | 232 | 22 |
| Volume Left | 904 | 0 | 0 | 232 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1255 | 1700 | 1700 | 9 | 677 |
| Volume to Capacity | 0.72 | 0.22 | 0.18 | 26.62 | 0.03 |
| Queue Length 95th (ft) | 168 | 0 | 0 | Err | 2 |
| Control Delay (s) | 14.9 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | B | | | F | B |
| Approach Delay (s) | 10.6 | | 0.0 | 9152.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1274.9 | | | |
| Intersection Capacity Utilization | 135.8% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2F
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.17 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 316 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1009 | 195 | 20 | 395 | 0 | 0 | 0 | 0 | 80 | 0 | 853 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1040 | 201 | 21 | 407 | 0 | 0 | 0 | 0 | 82 | 0 | 879 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1040 | 66 | 21 | 407 | 0 | 0 | 0 | 0 | 82 | 442 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.4 | 8.6 | 22.8 | 22.8 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 37.4 | 9.6 | 23.8 | 23.8 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1099 | 240 | 119 | 706 | | | | | 503 | 449 | |
| v/s Ratio Prot | | c0.56 | 0.04 | | 0.22 | | | | | | c0.28 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.28 | 0.18 | 0.58 | | | | | 0.16 | 0.98 | |
| Uniform Delay, d1 | | 12.1 | 23.8 | 13.2 | 15.8 | | | | | 17.0 | 22.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 15.8 | 0.6 | 0.7 | 1.1 | | | | | 0.2 | 38.2 | |
| Delay (s) | | 27.9 | 24.4 | 14.0 | 16.9 | | | | | 17.2 | 60.8 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 27.3 | | | 16.8 | | | 0.0 | | | 57.0 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | | |
|---|---|---|---|---|---|
| HCM Average Control Delay | 36.5 | HCM Level of Service | | D | |
| HCM Volume to Capacity ratio | 0.96 | | | | |
| Actuated Cycle Length (s) | 63.4 | Sum of lost time (s) | | 8.0 | |
| Intersection Capacity Utilization | 135.8% | ICU Level of Service | | H | |
| Analysis Period (min) | 15 | | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project PM Peak - Alt 2F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1845 | | 1770 | 1840 | | 1787 | 1688 | | 1770 | 1707 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.59 | 1.00 | |
| Satd. Flow (perm) | 151 | 1845 | | 151 | 1840 | | 1062 | 1688 | | 1094 | 1707 | |
| Volume (vph) | 80 | 839 | 55 | 112 | 906 | 80 | 55 | 46 | 100 | 230 | 70 | 87 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 85 | 893 | 59 | 119 | 964 | 85 | 59 | 49 | 106 | 245 | 74 | 93 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 80 | 0 | 0 | 51 | 0 |
| Lane Group Flow (vph) | 85 | 949 | 0 | 119 | 1045 | 0 | 59 | 75 | 0 | 245 | 116 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.8 | 48.2 | | 52.8 | 48.2 | | 20.2 | 20.2 | | 20.2 | 20.2 | |
| Effective Green, g (s) | 54.8 | 49.2 | | 54.8 | 49.2 | | 21.2 | 21.2 | | 21.2 | 21.2 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.62 | 0.56 | | 0.24 | 0.24 | | 0.24 | 0.24 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 197 | 1032 | | 197 | 1029 | | 256 | 407 | | 264 | 411 | |
| v/s Ratio Prot | 0.03 | 0.51 | | c0.04 | c0.57 | | | 0.04 | | | 0.07 | |
| v/s Ratio Perm | 0.24 | | | 0.34 | | | 0.06 | | | c0.22 | | |
| v/c Ratio | 0.43 | 0.92 | | 0.60 | 1.02 | | 0.23 | 0.18 | | 0.93 | 0.28 | |
| Uniform Delay, d1 | 20.3 | 17.6 | | 17.2 | 19.4 | | 26.8 | 26.5 | | 32.7 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 12.7 | | 3.6 | 32.1 | | 0.5 | 0.2 | | 36.2 | 0.4 | |
| Delay (s) | 20.9 | 30.3 | | 20.8 | 51.5 | | 27.3 | 26.7 | | 68.9 | 27.6 | |
| Level of Service | C | C | | C | D | | C | C | | E | C | |
| Approach Delay (s) | | 29.5 | | | 48.4 | | | 26.9 | | | 52.1 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 40.4 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.96 | | | |
| Actuated Cycle Length (s) | 88.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 92.2% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project PM Peak - Alt 2F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 959 | 10 | 30 | 978 | 50 | 10 | 5 | 20 | 55 | 5 | 17 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 11 | 979 | 10 | 31 | 998 | 51 | 10 | 5 | 20 | 56 | 5 | 17 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1049 | | | 989 | | | 2085 | 2116 | 984 | 2109 | 2096 | 1023 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1049 | | | 989 | | | 2085 | 2116 | 984 | 2109 | 2096 | 1023 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 96 | | | 68 | 89 | 93 | 0 | 90 | 94 |
| cM capacity (veh/h) | 663 | | | 703 | | | 32 | 47 | 300 | 31 | 50 | 289 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 989 | 31 | 1049 | 15 | 20 | 61 | 17 |
| Volume Left | 11 | 0 | 31 | 0 | 10 | 0 | 56 | 0 |
| Volume Right | 0 | 10 | 0 | 51 | 0 | 20 | 0 | 17 |
| cSH | 663 | 1700 | 703 | 1700 | 36 | 300 | 32 | 289 |
| Volume to Capacity | 0.02 | 0.58 | 0.04 | 0.62 | 0.43 | 0.07 | 1.92 | 0.06 |
| Queue Length 95th (ft) | 1 | 0 | 3 | 0 | 36 | 5 | 174 | 5 |
| Control Delay (s) | 10.5 | 0.0 | 10.4 | 0.0 | 166.7 | 17.9 | 699.6 | 18.3 |
| Lane LOS | B | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 0.3 | | 81.6 | | 549.1 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 21.2 | | | |
| Intersection Capacity Utilization | 71.2% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1849 | | 1805 | 1880 | |
| Flt Permitted | | 0.78 | | | 0.83 | | 0.17 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | | 1424 | | | 1493 | | 323 | 1849 | | 608 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 73 | 100 | 65 | 90 | 387 | 84 | 120 | 580 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 80 | 110 | 71 | 99 | 425 | 92 | 132 | 637 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 25 | 0 | 0 | 14 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 236 | 0 | 99 | 503 | 0 | 132 | 681 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 570 | | | 597 | | 147 | 840 | | 276 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.27 | | | c0.36 | |
| v/s Ratio Perm | | c0.23 | | | 0.16 | | 0.31 | | | 0.22 | | |
| v/c Ratio | | 0.56 | | | 0.40 | | 0.67 | 0.60 | | 0.48 | 0.80 | |
| Uniform Delay, d1 | | 12.8 | | | 11.8 | | 11.8 | 11.2 | | 10.5 | 12.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.0 | | | 2.0 | | 22.0 | 3.1 | | 5.8 | 7.6 | |
| Delay (s) | | 16.8 | | | 13.7 | | 33.8 | 14.4 | | 16.3 | 20.4 | |
| Level of Service | | B | | | B | | C | B | | B | C | |
| Approach Delay (s) | | 16.8 | | | 13.7 | | | 17.5 | | | 19.8 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 17.8 | HCM Level of Service | B |
| HCM Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 74.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1744 | | 1787 | 1689 | | 1805 | 1900 | 1615 | 1787 | 1868 | |
| Flt Permitted | 0.36 | 1.00 | | 0.41 | 1.00 | | 0.37 | 1.00 | 1.00 | 0.37 | 1.00 | |
| Satd. Flow (perm) | 653 | 1744 | | 768 | 1689 | | 699 | 1900 | 1615 | 698 | 1868 | |
| Volume (vph) | 10 | 160 | 35 | 363 | 120 | 255 | 33 | 291 | 251 | 295 | 423 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 38 | 390 | 129 | 274 | 35 | 313 | 270 | 317 | 455 | 22 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 94 | 0 | 0 | 0 | 177 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 199 | 0 | 390 | 309 | 0 | 35 | 313 | 93 | 317 | 475 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 18.9 | 17.8 | | 29.8 | 23.7 | | 28.4 | 26.2 | 26.2 | 39.2 | 32.0 | |
| Effective Green, g (s) | 20.9 | 18.8 | | 30.8 | 24.7 | | 30.4 | 27.2 | 27.2 | 40.2 | 33.0 | |
| Actuated g/C Ratio | 0.26 | 0.24 | | 0.39 | 0.31 | | 0.38 | 0.34 | 0.34 | 0.51 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 201 | 415 | | 403 | 528 | | 314 | 654 | 556 | 479 | 780 | |
| v/s Ratio Prot | 0.00 | 0.11 | | c0.10 | 0.18 | | 0.00 | 0.16 | | c0.08 | 0.25 | |
| v/s Ratio Perm | 0.01 | | | c0.28 | | | 0.04 | | 0.06 | c0.26 | | |
| v/c Ratio | 0.05 | 0.48 | | 0.97 | 0.58 | | 0.11 | 0.48 | 0.17 | 0.66 | 0.61 | |
| Uniform Delay, d1 | 21.7 | 25.9 | | 22.9 | 22.8 | | 15.5 | 20.3 | 18.0 | 12.7 | 18.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 36.0 | 1.7 | | 0.2 | 2.5 | 0.6 | 3.4 | 3.5 | |
| Delay (s) | 21.8 | 26.8 | | 58.9 | 24.5 | | 15.7 | 22.8 | 18.7 | 16.1 | 21.5 | |
| Level of Service | C | C | | E | C | | B | C | B | B | C | |
| Approach Delay (s) | | 26.5 | | | 41.4 | | | 20.6 | | | 19.3 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM Average Control Delay | 27.5 | HCM Level of Service | C |
| HCM Volume to Capacity ratio | 0.77 | | |
| Actuated Cycle Length (s) | 79.0 | Sum of lost time (s) | 8.0 |
| Intersection Capacity Utilization | 75.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2F
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.95 | | | | 0.99 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1780 | | | | | 1861 | 1792 | | | | 1800 | |
| Flt Permitted | 0.96 | | | | | 0.57 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1780 | | | | | 1065 | 1792 | | | | 1800 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 455 | 606 | 75 | 255 | 5 | 150 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 495 | 659 | 82 | 277 | 5 | 163 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 180 | 0 | 0 | 0 | 0 | 507 | 1005 | 0 | 0 | 0 | 177 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.9 | | | | | 39.3 | 39.3 | | | | 12.7 | |
| Effective Green, g (s) | 13.9 | | | | | 40.3 | 40.3 | | | | 13.7 | |
| Actuated g/C Ratio | 0.17 | | | | | 0.50 | 0.50 | | | | 0.17 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 310 | | | | | 537 | 904 | | | | 309 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.56 | | | | c0.10 | |
| v/s Ratio Perm | | | | | | 0.48 | | | | | | |
| v/c Ratio | 0.58 | | | | | 0.94 | 1.11 | | | | 0.57 | |
| Uniform Delay, d1 | 30.3 | | | | | 18.7 | 19.8 | | | | 30.4 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.8 | | | | | 25.4 | 65.3 | | | | 2.5 | |
| Delay (s) | 33.1 | | | | | 44.2 | 85.1 | | | | 32.9 | |
| Level of Service | C | | | | | D | F | | | | C | |
| Approach Delay (s) | 33.1 | | | | | 44.2 | 85.1 | | | | 32.9 | |
| Approach LOS | C | | | | | D | F | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 64.2 | HCM Level of Service | E | |
| HCM Volume to Capacity ratio | 0.89 | | | |
| Actuated Cycle Length (s) | 79.9 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.5% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 2F
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 5 | 0 | 31 | 10 | 249 | 9 | 62 | 214 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 5 | 0 | 34 | 11 | 262 | 10 | 67 | 225 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 680 | 656 | 228 | 659 | 653 | 267 | 231 | | | 272 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 680 | 656 | 228 | 659 | 653 | 267 | 231 | | | 272 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 97 | 100 | 99 | 98 | 100 | 96 | 99 | | | 95 | | |
| cM capacity (veh/h) | 329 | 362 | 802 | 355 | 363 | 772 | 1337 | | | 1291 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 21 | 5 | 34 | 11 | 272 | 67 | 231 |
| Volume Left | 11 | 5 | 0 | 11 | 0 | 67 | 0 |
| Volume Right | 11 | 0 | 34 | 0 | 10 | 0 | 5 |
| cSH | 466 | 355 | 772 | 1337 | 1700 | 1291 | 1700 |
| Volume to Capacity | 0.05 | 0.02 | 0.04 | 0.01 | 0.16 | 0.05 | 0.14 |
| Queue Length 95th (ft) | 4 | 1 | 3 | 1 | 0 | 4 | 0 |
| Control Delay (s) | 13.1 | 15.3 | 9.9 | 7.7 | 0.0 | 7.9 | 0.0 |
| Lane LOS | B | C | A | A | | A | |
| Approach Delay (s) | 13.1 | 10.6 | | 0.3 | | 1.8 | |
| Approach LOS | B | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.0 | | | |
| Intersection Capacity Utilization | 34.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

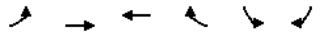
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 180 | 77 | 46 | 150 | 66 | 43 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 191 | 82 | 49 | 160 | 70 | 46 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 235 | 49 | | | 49 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 235 | 49 | | | 49 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 73 | 92 | | | 95 | |
| cM capacity (veh/h) | 721 | 1023 | | | 1552 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 191 | 82 | 49 | 160 | 116 |
| Volume Left | 191 | 0 | 0 | 0 | 70 |
| Volume Right | 0 | 82 | 0 | 160 | 0 |
| cSH | 721 | 1023 | 1700 | 1700 | 1552 |
| Volume to Capacity | 0.27 | 0.08 | 0.03 | 0.09 | 0.05 |
| Queue Length 95th (ft) | 27 | 7 | 0 | 0 | 4 |
| Control Delay (s) | 11.8 | 8.8 | 0.0 | 0.0 | 4.6 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 10.9 | | 0.0 | | 4.6 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 29.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



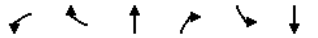




| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 61 | 10 | 5 | 5 | 45 | 67 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 70 | 11 | 6 | 6 | 52 | 77 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 160 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 160 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 94 | 93 |
| cM capacity (veh/h) | 1595 | | | | 799 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 82 | 11 | 129 |
| Volume Left | 70 | 0 | 52 |
| Volume Right | 0 | 6 | 77 |
| cSH | 1595 | 1700 | 946 |
| Volume to Capacity | 0.04 | 0.01 | 0.14 |
| Queue Length 95th (ft) | 3 | 0 | 12 |
| Control Delay (s) | 6.4 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.4 | 0.0 | 9.4 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.8 | | |
| Intersection Capacity Utilization | 23.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 14 | 67 | 261 | 24 | 130 | 267 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 15 | 73 | 284 | 26 | 141 | 290 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 870 | 297 | | | 310 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 870 | 297 | | | 310 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 95 | 90 | | | 89 | |
| cM capacity (veh/h) | 286 | 743 | | | 1251 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 88 | 310 | 432 |
| Volume Left | 15 | 0 | 141 |
| Volume Right | 73 | 26 | 0 |
| cSH | 582 | 1700 | 1251 |
| Volume to Capacity | 0.15 | 0.18 | 0.11 |
| Queue Length 95th (ft) | 13 | 0 | 10 |
| Control Delay (s) | 12.3 | 0.0 | 3.5 |
| Lane LOS | B | | A |
| Approach Delay (s) | 12.3 | 0.0 | 3.5 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.1 | | |
| Intersection Capacity Utilization | 51.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 3D
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 701 | 145 | 0 | 0 | 276 | 35 | 137 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 855 | 177 | 0 | 0 | 337 | 43 | 167 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 177 | | | 2245 | 2266 | 177 | 2251 | 2245 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 177 | | | 2245 | 2266 | 177 | 2251 | 2245 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1393 | | | 12 | 11 | 861 | 12 | 11 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 855 | 177 | 379 | 167 | 6 |
| Volume Left | 855 | 0 | 0 | 167 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 12 | 861 |
| Volume to Capacity | 0.73 | 0.10 | 0.22 | 14.09 | 0.01 |
| Queue Length 95th (ft) | 174 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.0 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.2 | | 0.0 | 9647.2 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1063.2 | | | |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 3D
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 781 | 146 | 10 | 403 | 0 | 0 | 0 | 0 | 20 | 0 | 587 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 888 | 166 | 11 | 458 | 0 | 0 | 0 | 0 | 23 | 0 | 667 |
| RTOR Reduction (vph) | 0 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 888 | 53 | 11 | 458 | 0 | 0 | 0 | 0 | 23 | 312 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 35.1 | 6.8 | 1.2 | 29.5 | | | | | 15.5 | 15.5 | |
| Effective Green, g (s) | | 36.1 | 7.8 | 2.2 | 30.5 | | | | | 16.5 | 16.5 | |
| Actuated g/C Ratio | | 0.54 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 987 | 181 | 58 | 851 | | | | | 421 | 376 | |
| v/s Ratio Prot | | c0.49 | | 0.01 | 0.25 | | | | | | c0.20 | |
| v/s Ratio Perm | | | c0.03 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.90 | 0.29 | 0.19 | 0.54 | | | | | 0.05 | 0.83 | |
| Uniform Delay, d1 | | 13.7 | 27.0 | 31.4 | 13.1 | | | | | 19.2 | 23.8 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 10.9 | 0.9 | 1.6 | 0.7 | | | | | 0.1 | 14.0 | |
| Delay (s) | | 24.6 | 27.9 | 33.0 | 13.7 | | | | | 19.3 | 37.8 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 25.1 | | | 14.2 | | | 0.0 | | | 37.2 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 26.6 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.86 | | | |
| Actuated Cycle Length (s) | 66.8 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 93.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 3D
3: Old Fairhaven Pkwy & 30th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.91 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1798 | | 1719 | 1771 | | 1703 | 1625 | | 1770 | 1756 | |
| Flt Permitted | 0.12 | 1.00 | | 0.23 | 1.00 | | 0.71 | 1.00 | | 0.52 | 1.00 | |
| Satd. Flow (perm) | 223 | 1798 | | 415 | 1771 | | 1272 | 1625 | | 965 | 1756 | |
| Volume (vph) | 57 | 672 | 30 | 45 | 715 | 120 | 40 | 55 | 90 | 140 | 40 | 25 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 65 | 764 | 34 | 51 | 812 | 136 | 45 | 62 | 102 | 159 | 45 | 28 |
| RTOR Reduction (vph) | 0 | 1 | 0 | 0 | 6 | 0 | 0 | 72 | 0 | 0 | 23 | 0 |
| Lane Group Flow (vph) | 65 | 797 | 0 | 51 | 942 | 0 | 45 | 92 | 0 | 159 | 50 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 57.9 | 53.4 | | 55.5 | 52.2 | | 13.9 | 13.9 | | 13.9 | 13.9 | |
| Effective Green, g (s) | 59.9 | 54.4 | | 57.5 | 53.2 | | 14.9 | 14.9 | | 14.9 | 14.9 | |
| Actuated g/C Ratio | 0.70 | 0.64 | | 0.67 | 0.62 | | 0.17 | 0.17 | | 0.17 | 0.17 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 252 | 1143 | | 344 | 1101 | | 221 | 283 | | 168 | 306 | |
| v/s Ratio Prot | c0.02 | 0.44 | | 0.01 | c0.53 | | | 0.06 | | | 0.03 | |
| v/s Ratio Perm | 0.16 | | | 0.09 | | | 0.04 | | | c0.16 | | |
| v/c Ratio | 0.26 | 0.70 | | 0.15 | 0.86 | | 0.20 | 0.33 | | 0.95 | 0.16 | |
| Uniform Delay, d1 | 11.3 | 10.2 | | 7.2 | 13.1 | | 30.3 | 31.0 | | 35.0 | 30.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.2 | 1.9 | | 0.1 | 6.7 | | 0.5 | 0.7 | | 53.3 | 0.3 | |
| Delay (s) | 11.5 | 12.1 | | 7.3 | 19.8 | | 30.7 | 31.6 | | 88.2 | 30.3 | |
| Level of Service | B | B | | A | B | | C | C | | F | C | |
| Approach Delay (s) | | 12.0 | | | 19.1 | | | 31.4 | | | 70.0 | |
| Approach LOS | | B | | | B | | | C | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 22.7 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.83 | | | |
| Actuated Cycle Length (s) | 85.6 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 73.5% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 3D
4: Old Fairhaven Pkwy & 24th St — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 586 | 37 | 78 | 677 | 65 | 84 | 18 | 178 | 35 | 8 | 15 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 11 | 644 | 41 | 86 | 744 | 71 | 92 | 20 | 196 | 38 | 9 | 16 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 815 | | | 685 | | | 1623 | 1673 | 664 | 1823 | 1658 | 780 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 815 | | | 685 | | | 1623 | 1673 | 664 | 1823 | 1658 | 780 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 90 | | | 0 | 77 | 57 | 0 | 90 | 96 |
| cM capacity (veh/h) | 799 | | | 899 | | | 67 | 85 | 459 | 26 | 87 | 394 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 685 | 86 | 815 | 112 | 196 | 47 | 16 |
| Volume Left | 11 | 0 | 86 | 0 | 92 | 0 | 38 | 0 |
| Volume Right | 0 | 41 | 0 | 71 | 0 | 196 | 0 | 16 |
| cSH | 799 | 1700 | 899 | 1700 | 69 | 459 | 30 | 394 |
| Volume to Capacity | 0.01 | 0.40 | 0.10 | 0.48 | 1.62 | 0.43 | 1.60 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 8 | 0 | 242 | 52 | 136 | 3 |
| Control Delay (s) | 9.6 | 0.0 | 9.4 | 0.0 | 436.0 | 18.6 | 587.2 | 14.5 |
| Lane LOS | A | | A | | F | C | F | B |
| Approach Delay (s) | 0.2 | | 0.9 | | 170.6 | | 439.1 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 41.4 | | | |
| Intersection Capacity Utilization | 65.2% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1723 | | 1736 | 1794 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.93 | | 0.55 | 1.00 | | 0.30 | 1.00 | |
| Satd. Flow (perm) | | 1510 | | | 1626 | | 1007 | 1794 | | 527 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 29 | 55 | 60 | 70 | 422 | 59 | 30 | 234 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 31 | 59 | 65 | 75 | 454 | 63 | 32 | 252 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 10 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 117 | 0 | 75 | 507 | 0 | 32 | 271 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 634 | | | 683 | | 423 | 753 | | 221 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.28 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.07 | | 0.07 | | | 0.06 | | |
| v/c Ratio | | 0.19 | | | 0.17 | | 0.18 | 0.67 | | 0.14 | 0.37 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 11.7 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.5 | | 0.9 | 4.8 | | 1.4 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.6 | | 10.0 | 16.5 | | 10.3 | 11.4 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.6 | | | 15.7 | | | 11.3 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.1 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.43 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 54.6% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1593 | | 1687 | 1622 | | 1770 | 1863 | 1583 | 1687 | 1759 | |
| Flt Permitted | 0.48 | 1.00 | | 0.52 | 1.00 | | 0.65 | 1.00 | 1.00 | 0.37 | 1.00 | |
| Satd. Flow (perm) | 781 | 1593 | | 928 | 1622 | | 1205 | 1863 | 1583 | 658 | 1759 | |
| Volume (vph) | 10 | 80 | 18 | 248 | 150 | 204 | 36 | 322 | 278 | 152 | 146 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 20 | 279 | 169 | 229 | 40 | 362 | 312 | 171 | 164 | 11 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 64 | 0 | 0 | 0 | 199 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 99 | 0 | 279 | 334 | 0 | 40 | 362 | 113 | 171 | 173 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.8 | 11.8 | | 26.4 | 20.4 | | 27.5 | 24.3 | 24.3 | 29.9 | 25.5 | |
| Effective Green, g (s) | 14.8 | 12.8 | | 27.4 | 21.4 | | 29.5 | 25.3 | 25.3 | 31.9 | 26.5 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.46 | 0.38 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 187 | 291 | | 477 | 495 | | 541 | 672 | 571 | 379 | 665 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.09 | c0.21 | | 0.00 | c0.19 | | c0.03 | 0.10 | |
| v/s Ratio Perm | 0.01 | | | 0.14 | | | 0.03 | | 0.07 | 0.17 | | |
| v/c Ratio | 0.06 | 0.34 | | 0.58 | 0.67 | | 0.07 | 0.54 | 0.20 | 0.45 | 0.26 | |
| Uniform Delay, d1 | 22.0 | 25.0 | | 15.7 | 21.3 | | 12.0 | 17.8 | 15.4 | 12.2 | 15.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 1.8 | 3.6 | | 0.1 | 3.1 | 0.8 | 0.9 | 0.9 | |
| Delay (s) | 22.1 | 25.7 | | 17.6 | 24.9 | | 12.1 | 20.9 | 16.2 | 13.1 | 16.0 | |
| Level of Service | C | C | | B | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.3 | | | 21.9 | | | 18.3 | | | 14.5 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 19.4 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.57 | | | |
| Actuated Cycle Length (s) | 70.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 55.8% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 3D
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | 4.0 | | | 4.0 | 4.0 | | 4.0 | | 4.0 | |
| Lane Util. Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Frt | 1.00 | | 0.85 | | | 1.00 | 0.98 | | 0.85 | | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (prot) | 1786 | | 1553 | | | 1807 | 1733 | | 1553 | | 1597 | |
| Flt Permitted | 0.95 | | 1.00 | | | 0.99 | 1.00 | | 1.00 | | 0.96 | |
| Satd. Flow (perm) | 1786 | | 1553 | | | 1791 | 1733 | | 1553 | | 1597 | |
| Volume (vph) | 205 | 7 | 5 | 5 | 7 | 346 | 132 | 15 | 245 | 5 | 125 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 9 | 6 | 6 | 9 | 449 | 171 | 19 | 258 | 5 | 132 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 157 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 275 | 0 | 6 | 0 | 0 | 464 | 190 | 0 | 101 | 0 | 150 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | Perm | Perm | Perm | | | | Perm | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | 7 | 2 | 2 | | | | 6 | | | |
| Actuated Green, G (s) | 14.0 | | 14.0 | | | 24.3 | 24.3 | | 24.3 | | 11.1 | |
| Effective Green, g (s) | 15.0 | | 15.0 | | | 25.3 | 25.3 | | 25.3 | | 12.1 | |
| Actuated g/C Ratio | 0.23 | | 0.23 | | | 0.39 | 0.39 | | 0.39 | | 0.19 | |
| Clearance Time (s) | 5.0 | | 5.0 | | | 5.0 | 5.0 | | 5.0 | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | 3.0 | | | 3.0 | 3.0 | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | 416 | | 362 | | | 704 | 681 | | 610 | | 300 | |
| v/s Ratio Prot | c0.15 | | | | | | 0.11 | | | | c0.09 | |
| v/s Ratio Perm | | | 0.00 | | | c0.26 | | | 0.07 | | | |
| v/c Ratio | 0.66 | | 0.02 | | | 0.66 | 0.28 | | 0.17 | | 0.50 | |
| Uniform Delay, d1 | 22.4 | | 19.0 | | | 16.0 | 13.3 | | 12.7 | | 23.4 | |
| Progression Factor | 1.00 | | 1.00 | | | 1.00 | 1.00 | | 1.00 | | 1.00 | |
| Incremental Delay, d2 | 3.9 | | 0.0 | | | 2.2 | 1.0 | | 0.6 | | 1.3 | |
| Delay (s) | 26.3 | | 19.0 | | | 18.3 | 14.4 | | 13.3 | | 24.7 | |
| Level of Service | C | | B | | | B | B | | B | | C | |
| Approach Delay (s) | 26.2 | | | | | 18.3 | 13.7 | | | | 24.7 | |
| Approach LOS | C | | | | | B | B | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 19.2 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.62 | | | |
| Actuated Cycle Length (s) | 64.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 58.1% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 3D
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 57 | 0 | 39 | 5 | 90 | 75 | 35 | 50 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 62 | 0 | 42 | 6 | 115 | 82 | 38 | 64 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 314 | 353 | 67 | 316 | 316 | 156 | 71 | | | 197 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 314 | 353 | 67 | 316 | 316 | 156 | 71 | | | 197 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 99 | 100 | 99 | 90 | 100 | 95 | 100 | | | 97 | | |
| cM capacity (veh/h) | 597 | 554 | 1002 | 618 | 581 | 889 | 1505 | | | 1376 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 13 | 104 | 6 | 197 | 38 | 71 |
| Volume Left | 6 | 62 | 6 | 0 | 38 | 0 |
| Volume Right | 6 | 42 | 0 | 82 | 0 | 6 |
| cSH | 748 | 705 | 1505 | 1700 | 1376 | 1700 |
| Volume to Capacity | 0.02 | 0.15 | 0.00 | 0.12 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 1 | 13 | 0 | 0 | 2 | 0 |
| Control Delay (s) | 9.9 | 11.0 | 7.4 | 0.0 | 7.7 | 0.0 |
| Lane LOS | A | B | A | | A | |
| Approach Delay (s) | 9.9 | 11.0 | 0.2 | | 2.7 | |
| Approach LOS | A | B | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 3.8 | | | |
| Intersection Capacity Utilization | 30.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

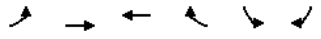
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 100 | 55 | 41 | 55 | 25 | 51 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 109 | 60 | 45 | 60 | 27 | 55 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 154 | 45 | | | 45 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 154 | 45 | | | 45 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 87 | 94 | | | 98 | |
| cM capacity (veh/h) | 815 | 1017 | | | 1514 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 109 | 60 | 45 | 60 | 83 |
| Volume Left | 109 | 0 | 0 | 0 | 27 |
| Volume Right | 0 | 60 | 0 | 60 | 0 |
| cSH | 815 | 1017 | 1700 | 1700 | 1514 |
| Volume to Capacity | 0.13 | 0.06 | 0.03 | 0.04 | 0.02 |
| Queue Length 95th (ft) | 11 | 5 | 0 | 0 | 1 |
| Control Delay (s) | 10.1 | 8.8 | 0.0 | 0.0 | 2.5 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.6 | | 0.0 | | 2.5 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.1 | | |
| Intersection Capacity Utilization | 22.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 55 | 5 | 5 | 35 | 5 | 25 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 65 | 6 | 6 | 42 | 6 | 30 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 164 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 164 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 96 | | | | 99 | 97 |
| cM capacity (veh/h) | 1573 | | | | 779 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 71 | 48 | 36 |
| Volume Left | 65 | 0 | 6 |
| Volume Right | 0 | 42 | 30 |
| cSH | 1573 | 1700 | 979 |
| Volume to Capacity | 0.04 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 3 | 0 | 3 |
| Control Delay (s) | 6.8 | 0.0 | 8.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.8 | 0.0 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.2 | | |
| Intersection Capacity Utilization | 20.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 69 | 174 | 5 | 20 | 45 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 75 | 189 | 5 | 22 | 49 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 284 | 192 | | | 195 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 284 | 192 | | | 195 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 91 | | | 98 | |
| cM capacity (veh/h) | 695 | 850 | | | 1379 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 80 | 195 | 71 |
| Volume Left | 5 | 0 | 22 |
| Volume Right | 75 | 5 | 0 |
| cSH | 837 | 1700 | 1379 |
| Volume to Capacity | 0.10 | 0.11 | 0.02 |
| Queue Length 95th (ft) | 8 | 0 | 1 |
| Control Delay (s) | 9.8 | 0.0 | 2.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.8 | 0.0 | 2.4 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.8 | | |
| Intersection Capacity Utilization | 27.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 3D
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 841 | 343 | 0 | 0 | 229 | 55 | 216 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 904 | 369 | 0 | 0 | 246 | 59 | 232 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 305 | | | 369 | | | 2453 | 2483 | 369 | 2475 | 2453 | 276 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 305 | | | 369 | | | 2453 | 2483 | 369 | 2475 | 2453 | 276 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 28 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1255 | | | 1195 | | | 9 | 8 | 677 | 8 | 9 | 768 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 904 | 369 | 305 | 232 | 22 |
| Volume Left | 904 | 0 | 0 | 232 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1255 | 1700 | 1700 | 9 | 677 |
| Volume to Capacity | 0.72 | 0.22 | 0.18 | 26.62 | 0.03 |
| Queue Length 95th (ft) | 168 | 0 | 0 | Err | 2 |
| Control Delay (s) | 14.9 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | B | | | F | B |
| Approach Delay (s) | 10.6 | | 0.0 | 9152.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1274.9 | | | |
| Intersection Capacity Utilization | 135.8% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 3D
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.17 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 316 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1009 | 195 | 20 | 395 | 0 | 0 | 0 | 0 | 80 | 0 | 853 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1040 | 201 | 21 | 407 | 0 | 0 | 0 | 0 | 82 | 0 | 879 |
| RTOR Reduction (vph) | 0 | 0 | 135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1040 | 66 | 21 | 407 | 0 | 0 | 0 | 0 | 82 | 442 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.4 | 8.6 | 22.8 | 22.8 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 37.4 | 9.6 | 23.8 | 23.8 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1099 | 240 | 119 | 706 | | | | | 503 | 449 | |
| v/s Ratio Prot | | c0.56 | 0.04 | | 0.22 | | | | | | c0.28 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.28 | 0.18 | 0.58 | | | | | 0.16 | 0.98 | |
| Uniform Delay, d1 | | 12.1 | 23.8 | 13.2 | 15.8 | | | | | 17.0 | 22.6 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 15.8 | 0.6 | 0.7 | 1.1 | | | | | 0.2 | 38.2 | |
| Delay (s) | | 27.9 | 24.4 | 14.0 | 16.9 | | | | | 17.2 | 60.8 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 27.3 | | | 16.8 | | | 0.0 | | | 57.0 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 36.5 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.96 | | | |
| Actuated Cycle Length (s) | 63.4 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 135.8% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project PM Peak - Alt 3D
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1846 | | 1770 | 1841 | | 1787 | 1688 | | 1770 | 1707 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.66 | 1.00 | |
| Satd. Flow (perm) | 150 | 1846 | | 150 | 1841 | | 1051 | 1688 | | 1227 | 1707 | |
| Volume (vph) | 91 | 864 | 55 | 90 | 928 | 80 | 55 | 35 | 75 | 230 | 70 | 87 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 97 | 919 | 59 | 96 | 987 | 85 | 59 | 37 | 80 | 245 | 74 | 93 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 62 | 0 | 0 | 52 | 0 |
| Lane Group Flow (vph) | 97 | 975 | 0 | 96 | 1069 | 0 | 59 | 55 | 0 | 245 | 115 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 53.3 | 48.7 | | 53.3 | 48.7 | | 19.2 | 19.2 | | 19.2 | 19.2 | |
| Effective Green, g (s) | 55.3 | 49.7 | | 55.3 | 49.7 | | 20.2 | 20.2 | | 20.2 | 20.2 | |
| Actuated g/C Ratio | 0.63 | 0.57 | | 0.63 | 0.57 | | 0.23 | 0.23 | | 0.23 | 0.23 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 198 | 1049 | | 198 | 1046 | | 243 | 390 | | 283 | 394 | |
| v/s Ratio Prot | c0.03 | 0.53 | | 0.03 | c0.58 | | | 0.03 | | | 0.07 | |
| v/s Ratio Perm | 0.28 | | | 0.27 | | | 0.06 | | | c0.20 | | |
| v/c Ratio | 0.49 | 0.93 | | 0.48 | 1.02 | | 0.24 | 0.14 | | 0.87 | 0.29 | |
| Uniform Delay, d1 | 20.4 | 17.3 | | 17.1 | 18.9 | | 27.4 | 26.8 | | 32.3 | 27.8 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.7 | 13.8 | | 0.7 | 33.4 | | 0.5 | 0.2 | | 23.0 | 0.4 | |
| Delay (s) | 21.1 | 31.1 | | 17.8 | 52.3 | | 27.9 | 26.9 | | 55.4 | 28.2 | |
| Level of Service | C | C | | B | D | | C | C | | E | C | |
| Approach Delay (s) | | 30.2 | | | 49.5 | | | 27.3 | | | 44.4 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 40.0 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.94 | | | |
| Actuated Cycle Length (s) | 87.5 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 91.3% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project PM Peak - Alt 3D
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 825 | 102 | 194 | 811 | 50 | 81 | 11 | 135 | 55 | 18 | 15 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 10 | 842 | 104 | 198 | 828 | 51 | 83 | 11 | 138 | 56 | 18 | 15 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 879 | | | 946 | | | 2162 | 2189 | 894 | 2255 | 2215 | 853 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 879 | | | 946 | | | 2162 | 2189 | 894 | 2255 | 2215 | 853 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 73 | | | 0 | 65 | 59 | 0 | 42 | 96 |
| cM capacity (veh/h) | 769 | | | 730 | | | 14 | 33 | 338 | 10 | 32 | 362 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 10 | 946 | 198 | 879 | 94 | 138 | 74 | 15 |
| Volume Left | 10 | 0 | 198 | 0 | 83 | 0 | 56 | 0 |
| Volume Right | 0 | 104 | 0 | 51 | 0 | 138 | 0 | 15 |
| cSH | 769 | 1700 | 730 | 1700 | 15 | 338 | 12 | 362 |
| Volume to Capacity | 0.01 | 0.56 | 0.27 | 0.52 | 6.16 | 0.41 | 6.04 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 27 | 0 | Err | 48 | Err | 3 |
| Control Delay (s) | 9.7 | 0.0 | 11.8 | 0.0 | Err | 22.7 | Err | 15.4 |
| Lane LOS | A | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 2.2 | | 4066.0 | | 8297.2 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 717.6 | | | |
| Intersection Capacity Utilization | 82.1% | ICU Level of Service | E | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

2022 With Project PM Peak - Alt 3D
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1852 | | 1805 | 1880 | |
| Flt Permitted | | 0.78 | | | 0.86 | | 0.17 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | | 1436 | | | 1531 | | 323 | 1852 | | 616 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 61 | 100 | 65 | 90 | 387 | 79 | 120 | 580 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 67 | 110 | 71 | 99 | 425 | 87 | 132 | 637 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 26 | 0 | 0 | 14 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 222 | 0 | 99 | 498 | 0 | 132 | 681 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 574 | | | 612 | | 147 | 842 | | 280 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.27 | | | c0.36 | |
| v/s Ratio Perm | | c0.22 | | | 0.14 | | 0.31 | | | 0.21 | | |
| v/c Ratio | | 0.56 | | | 0.36 | | 0.67 | 0.59 | | 0.47 | 0.80 | |
| Uniform Delay, d1 | | 12.8 | | | 11.6 | | 11.8 | 11.2 | | 10.4 | 12.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 3.9 | | | 1.7 | | 22.0 | 3.0 | | 5.6 | 7.6 | |
| Delay (s) | | 16.7 | | | 13.2 | | 33.8 | 14.2 | | 16.0 | 20.4 | |
| Level of Service | | B | | | B | | C | B | | B | C | |
| Approach Delay (s) | | 16.7 | | | 13.2 | | | 17.4 | | | 19.7 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 17.7 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.69 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 76.5% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

2022 With Project PM Peak - Alt 3D
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1744 | | 1787 | 1686 | | 1805 | 1900 | 1615 | 1787 | 1867 | |
| Flt Permitted | 0.33 | 1.00 | | 0.41 | 1.00 | | 0.42 | 1.00 | 1.00 | 0.40 | 1.00 | |
| Satd. Flow (perm) | 600 | 1744 | | 768 | 1686 | | 807 | 1900 | 1615 | 746 | 1867 | |
| Volume (vph) | 10 | 160 | 35 | 188 | 120 | 271 | 32 | 270 | 116 | 327 | 379 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 38 | 202 | 129 | 291 | 34 | 290 | 125 | 352 | 408 | 22 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 100 | 0 | 0 | 0 | 82 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 199 | 0 | 202 | 320 | 0 | 34 | 290 | 43 | 352 | 428 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 18.9 | 17.8 | | 29.8 | 23.7 | | 28.4 | 26.2 | 26.2 | 39.2 | 32.0 | |
| Effective Green, g (s) | 20.9 | 18.8 | | 30.8 | 24.7 | | 30.4 | 27.2 | 27.2 | 40.2 | 33.0 | |
| Actuated g/C Ratio | 0.26 | 0.24 | | 0.39 | 0.31 | | 0.38 | 0.34 | 0.34 | 0.51 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 188 | 415 | | 403 | 527 | | 351 | 654 | 556 | 498 | 780 | |
| v/s Ratio Prot | 0.00 | 0.11 | | c0.05 | c0.19 | | 0.00 | 0.15 | | c0.08 | 0.23 | |
| v/s Ratio Perm | 0.01 | | | 0.14 | | | 0.03 | | 0.03 | c0.28 | | |
| v/c Ratio | 0.06 | 0.48 | | 0.50 | 0.61 | | 0.10 | 0.44 | 0.08 | 0.71 | 0.55 | |
| Uniform Delay, d1 | 21.8 | 25.9 | | 17.1 | 23.0 | | 15.4 | 20.0 | 17.4 | 13.2 | 17.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 1.0 | 2.0 | | 0.1 | 2.2 | 0.3 | 4.5 | 2.8 | |
| Delay (s) | 21.9 | 26.8 | | 18.0 | 25.0 | | 15.5 | 22.2 | 17.7 | 17.7 | 20.1 | |
| Level of Service | C | C | | B | C | | B | C | B | B | C | |
| Approach Delay (s) | | 26.5 | | | 22.8 | | | 20.5 | | | 19.1 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 21.3 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.63 | | | |
| Actuated Cycle Length (s) | 79.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 73.6% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 3D
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.95 | | | | 0.98 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1780 | | | | | 1860 | 1795 | | | | 1783 | |
| Flt Permitted | 0.96 | | | | | 0.93 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1780 | | | | | 1737 | 1795 | | | | 1783 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 403 | 502 | 5 | 255 | 5 | 45 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 438 | 546 | 5 | 277 | 5 | 49 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 180 | 0 | 0 | 0 | 0 | 450 | 811 | 0 | 0 | 0 | 56 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.5 | | | | | 39.2 | 39.2 | | | | 7.9 | |
| Effective Green, g (s) | 13.5 | | | | | 40.2 | 40.2 | | | | 8.9 | |
| Actuated g/C Ratio | 0.18 | | | | | 0.54 | 0.54 | | | | 0.12 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 322 | | | | | 936 | 967 | | | | 213 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.45 | | | | c0.03 | |
| v/s Ratio Perm | | | | | | 0.26 | | | | | | |
| v/c Ratio | 0.56 | | | | | 0.48 | 0.84 | | | | 0.26 | |
| Uniform Delay, d1 | 27.8 | | | | | 10.7 | 14.5 | | | | 29.9 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.1 | | | | | 0.4 | 8.7 | | | | 0.7 | |
| Delay (s) | 29.9 | | | | | 11.1 | 23.1 | | | | 30.5 | |
| Level of Service | C | | | | | B | C | | | | C | |
| Approach Delay (s) | 29.9 | | | | | 11.1 | 23.1 | | | | 30.5 | |
| Approach LOS | C | | | | | B | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 20.7 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.70 | | | |
| Actuated Cycle Length (s) | 74.6 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 66.5% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 3D
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 96 | 0 | 58 | 10 | 155 | 102 | 53 | 140 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 104 | 0 | 63 | 11 | 163 | 111 | 58 | 147 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 512 | 560 | 150 | 513 | 507 | 219 | 153 | | | 274 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 512 | 560 | 150 | 513 | 507 | 219 | 153 | | | 274 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 97 | 100 | 99 | 77 | 100 | 92 | 99 | | | 96 | | |
| cM capacity (veh/h) | 413 | 414 | 886 | 448 | 444 | 821 | 1428 | | | 1289 | | |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|
| Volume Total | 21 | 167 | 11 | 274 | 58 | 153 |
| Volume Left | 11 | 104 | 11 | 0 | 58 | 0 |
| Volume Right | 11 | 63 | 0 | 111 | 0 | 5 |
| cSH | 563 | 540 | 1428 | 1700 | 1289 | 1700 |
| Volume to Capacity | 0.04 | 0.31 | 0.01 | 0.16 | 0.04 | 0.09 |
| Queue Length 95th (ft) | 3 | 33 | 1 | 0 | 4 | 0 |
| Control Delay (s) | 11.6 | 14.6 | 7.5 | 0.0 | 7.9 | 0.0 |
| Lane LOS | B | B | A | | A | |
| Approach Delay (s) | 11.6 | 14.6 | 0.3 | | 2.2 | |
| Approach LOS | B | B | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.7 | | | |
| Intersection Capacity Utilization | 39.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

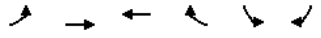
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 150 | 55 | 71 | 125 | 55 | 73 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 160 | 59 | 76 | 133 | 59 | 78 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 270 | 76 | | | 76 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 270 | 76 | | | 76 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 77 | 94 | | | 96 | |
| cM capacity (veh/h) | 693 | 989 | | | 1517 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 160 | 59 | 76 | 133 | 136 |
| Volume Left | 160 | 0 | 0 | 0 | 59 |
| Volume Right | 0 | 59 | 0 | 133 | 0 |
| cSH | 693 | 989 | 1700 | 1700 | 1517 |
| Volume to Capacity | 0.23 | 0.06 | 0.04 | 0.08 | 0.04 |
| Queue Length 95th (ft) | 22 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 11.7 | 8.9 | 0.0 | 0.0 | 3.4 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 11.0 | | 0.0 | | 3.4 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.1 | | |
| Intersection Capacity Utilization | 28.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 50 | 10 | 5 | 5 | 45 | 45 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 57 | 11 | 6 | 6 | 52 | 52 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 135 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 135 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 94 | 95 |
| cM capacity (veh/h) | 1595 | | | | 832 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 69 | 11 | 103 |
| Volume Left | 57 | 0 | 52 |
| Volume Right | 0 | 6 | 52 |
| cSH | 1595 | 1700 | 940 |
| Volume to Capacity | 0.04 | 0.01 | 0.11 |
| Queue Length 95th (ft) | 3 | 0 | 9 |
| Control Delay (s) | 6.2 | 0.0 | 9.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.2 | 0.0 | 9.3 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.5 | | |
| Intersection Capacity Utilization | 21.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 5 | 36 | 198 | 5 | 66 | 198 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 39 | 215 | 5 | 72 | 215 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 577 | 218 | | | 221 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 577 | 218 | | | 221 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 95 | | | 95 | |
| cM capacity (veh/h) | 453 | 822 | | | 1349 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 45 | 221 | 287 |
| Volume Left | 5 | 0 | 72 |
| Volume Right | 39 | 5 | 0 |
| cSH | 748 | 1700 | 1349 |
| Volume to Capacity | 0.06 | 0.13 | 0.05 |
| Queue Length 95th (ft) | 5 | 0 | 4 |
| Control Delay (s) | 10.1 | 0.0 | 2.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.1 | 0.0 | 2.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.0 | | |
| Intersection Capacity Utilization | 38.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 4F
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 704 | 145 | 0 | 0 | 276 | 35 | 138 | 0 | 5 | 0 | 0 | 0 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Hourly flow rate (vph) | 859 | 177 | 0 | 0 | 337 | 43 | 168 | 0 | 6 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 379 | | | 177 | | | 2252 | 2273 | 177 | 2258 | 2252 | 358 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 379 | | | 177 | | | 2252 | 2273 | 177 | 2258 | 2252 | 358 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 27 | | | 100 | | | 0 | 100 | 99 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1168 | | | 1393 | | | 12 | 11 | 861 | 12 | 11 | 691 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 859 | 177 | 379 | 168 | 6 |
| Volume Left | 859 | 0 | 0 | 168 | 0 |
| Volume Right | 0 | 0 | 43 | 0 | 6 |
| cSH | 1168 | 1700 | 1700 | 12 | 861 |
| Volume to Capacity | 0.73 | 0.10 | 0.22 | 14.47 | 0.01 |
| Queue Length 95th (ft) | 176 | 0 | 0 | Err | 1 |
| Control Delay (s) | 16.1 | 0.0 | 0.0 | Err | 9.2 |
| Lane LOS | C | | | F | A |
| Approach Delay (s) | 13.3 | | 0.0 | 9649.7 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1067.7 | | | |
| Intersection Capacity Utilization | 93.4% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 4F
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Flt Permitted | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1827 | 1553 | 1770 | 1863 | | | | | 1703 | 1524 | |
| Volume (vph) | 0 | 784 | 147 | 10 | 404 | 0 | 0 | 0 | 0 | 20 | 0 | 587 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 0 | 891 | 167 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 0 | 667 |
| RTOR Reduction (vph) | 0 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 0 |
| Lane Group Flow (vph) | 0 | 891 | 54 | 11 | 459 | 0 | 0 | 0 | 0 | 23 | 312 | 0 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 2% | 2% | 2% | 0% | 0% | 0% | 6% | 6% | 6% |
| Turn Type | | | custom | Prot | | | | | | Perm | | |
| Protected Phases | | 2 | | 1 | 6 | | | | | | 4 | |
| Permitted Phases | | | 5 | | | | | | | 4 | | |
| Actuated Green, G (s) | | 35.3 | 6.8 | 1.2 | 29.7 | | | | | 15.5 | 15.5 | |
| Effective Green, g (s) | | 36.3 | 7.8 | 2.2 | 30.7 | | | | | 16.5 | 16.5 | |
| Actuated g/C Ratio | | 0.54 | 0.12 | 0.03 | 0.46 | | | | | 0.25 | 0.25 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 990 | 181 | 58 | 854 | | | | | 419 | 375 | |
| v/s Ratio Prot | | c0.49 | | 0.01 | 0.25 | | | | | | c0.20 | |
| v/s Ratio Perm | | | c0.03 | | | | | | | 0.01 | | |
| v/c Ratio | | 0.90 | 0.30 | 0.19 | 0.54 | | | | | 0.05 | 0.83 | |
| Uniform Delay, d1 | | 13.7 | 27.1 | 31.5 | 13.0 | | | | | 19.3 | 23.9 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 11.0 | 0.9 | 1.6 | 0.7 | | | | | 0.1 | 14.5 | |
| Delay (s) | | 24.8 | 28.0 | 33.1 | 13.7 | | | | | 19.3 | 38.5 | |
| Level of Service | | C | C | C | B | | | | | B | D | |
| Approach Delay (s) | | 25.3 | | | 14.2 | | | 0.0 | | | 37.8 | |
| Approach LOS | | C | | | B | | | A | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 26.8 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.86 | | | |
| Actuated Cycle Length (s) | 67.0 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 93.4% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Old Fairhaven Pkwy & 30th St

2022 With Project AM Peak - Alt 4F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.98 | | 1.00 | 0.90 | | 1.00 | 0.94 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1719 | 1797 | | 1719 | 1770 | | 1703 | 1609 | | 1770 | 1751 | |
| Flt Permitted | 0.10 | 1.00 | | 0.20 | 1.00 | | 0.71 | 1.00 | | 0.48 | 1.00 | |
| Satd. Flow (perm) | 177 | 1797 | | 364 | 1770 | | 1269 | 1609 | | 893 | 1751 | |
| Volume (vph) | 55 | 645 | 30 | 70 | 696 | 120 | 40 | 56 | 121 | 140 | 40 | 26 |
| Peak-hour factor, PHF | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Adj. Flow (vph) | 62 | 733 | 34 | 80 | 791 | 136 | 45 | 64 | 138 | 159 | 45 | 30 |
| RTOR Reduction (vph) | 0 | 2 | 0 | 0 | 6 | 0 | 0 | 89 | 0 | 0 | 24 | 0 |
| Lane Group Flow (vph) | 62 | 765 | 0 | 80 | 921 | 0 | 45 | 113 | 0 | 159 | 51 | 0 |
| Heavy Vehicles (%) | 5% | 5% | 5% | 5% | 5% | 5% | 6% | 6% | 6% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.0 | 47.5 | | 52.0 | 47.5 | | 17.1 | 17.1 | | 17.1 | 17.1 | |
| Effective Green, g (s) | 54.0 | 48.5 | | 54.0 | 48.5 | | 18.1 | 18.1 | | 18.1 | 18.1 | |
| Actuated g/C Ratio | 0.64 | 0.58 | | 0.64 | 0.58 | | 0.22 | 0.22 | | 0.22 | 0.22 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 214 | 1036 | | 322 | 1021 | | 273 | 346 | | 192 | 377 | |
| v/s Ratio Prot | c0.02 | 0.43 | | 0.02 | c0.52 | | | 0.07 | | | 0.03 | |
| v/s Ratio Perm | 0.17 | | | 0.14 | | | 0.04 | | | c0.18 | | |
| v/c Ratio | 0.29 | 0.74 | | 0.25 | 0.90 | | 0.16 | 0.33 | | 0.83 | 0.14 | |
| Uniform Delay, d1 | 13.2 | 13.1 | | 9.0 | 15.7 | | 26.9 | 27.8 | | 31.5 | 26.7 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 2.8 | | 0.1 | 10.9 | | 0.3 | 0.6 | | 24.4 | 0.2 | |
| Delay (s) | 13.5 | 15.9 | | 9.2 | 26.6 | | 27.1 | 28.4 | | 56.0 | 26.8 | |
| Level of Service | B | B | | A | C | | C | C | | E | C | |
| Approach Delay (s) | | 15.7 | | | 25.2 | | | 28.2 | | | 46.6 | |
| Approach LOS | | B | | | C | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 24.3 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.84 | | | |
| Actuated Cycle Length (s) | 84.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 80.4% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis
4: Old Fairhaven Pkwy & 24th St

2022 With Project AM Peak - Alt 4F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 12 | 700 | 5 | 15 | 717 | 65 | 5 | 5 | 40 | 35 | 5 | 16 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Hourly flow rate (vph) | 13 | 769 | 5 | 16 | 788 | 71 | 5 | 5 | 44 | 38 | 5 | 18 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 859 | | | 775 | | | 1640 | 1691 | 772 | 1699 | 1658 | 824 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 859 | | | 775 | | | 1640 | 1691 | 772 | 1699 | 1658 | 824 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 98 | | | 92 | 94 | 89 | 36 | 94 | 95 |
| cM capacity (veh/h) | 769 | | | 832 | | | 71 | 89 | 398 | 60 | 94 | 372 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 775 | 16 | 859 | 11 | 44 | 44 | 18 |
| Volume Left | 13 | 0 | 16 | 0 | 5 | 0 | 38 | 0 |
| Volume Right | 0 | 5 | 0 | 71 | 0 | 44 | 0 | 18 |
| cSH | 769 | 1700 | 832 | 1700 | 79 | 398 | 63 | 372 |
| Volume to Capacity | 0.02 | 0.46 | 0.02 | 0.51 | 0.14 | 0.11 | 0.70 | 0.05 |
| Queue Length 95th (ft) | 1 | 0 | 2 | 0 | 12 | 9 | 77 | 4 |
| Control Delay (s) | 9.8 | 0.0 | 9.4 | 0.0 | 57.9 | 15.2 | 146.3 | 15.2 |
| Lane LOS | A | | A | | F | C | F | C |
| Approach Delay (s) | 0.2 | | 0.2 | | 23.7 | | 108.8 | |
| Approach LOS | | | | | C | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 4.7 | | | |
| Intersection Capacity Utilization | 58.3% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis
5: Harris Ave & 12th St

2022 With Project AM Peak - Alt 4F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.97 | | | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1750 | | | 1724 | | 1736 | 1788 | | 1671 | 1734 | |
| Flt Permitted | | 0.84 | | | 0.93 | | 0.55 | 1.00 | | 0.28 | 1.00 | |
| Satd. Flow (perm) | | 1508 | | | 1617 | | 1005 | 1788 | | 499 | 1734 | |
| Volume (vph) | 55 | 45 | 30 | 32 | 55 | 60 | 70 | 426 | 70 | 30 | 235 | 25 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 59 | 48 | 32 | 34 | 59 | 65 | 75 | 458 | 75 | 32 | 253 | 27 |
| RTOR Reduction (vph) | 0 | 19 | 0 | 0 | 38 | 0 | 0 | 12 | 0 | 0 | 8 | 0 |
| Lane Group Flow (vph) | 0 | 120 | 0 | 0 | 120 | 0 | 75 | 521 | 0 | 32 | 272 | 0 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% | 8% | 8% | 8% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 20.0 | | | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Effective Green, g (s) | | 21.0 | | | 21.0 | | 21.0 | 21.0 | | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.42 | | | 0.42 | | 0.42 | 0.42 | | 0.42 | 0.42 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 633 | | | 679 | | 422 | 751 | | 210 | 728 | |
| v/s Ratio Prot | | | | | | | | c0.29 | | | 0.16 | |
| v/s Ratio Perm | | c0.08 | | | 0.07 | | 0.07 | | | 0.06 | | |
| v/c Ratio | | 0.19 | | | 0.18 | | 0.18 | 0.69 | | 0.15 | 0.37 | |
| Uniform Delay, d1 | | 9.1 | | | 9.1 | | 9.1 | 11.9 | | 9.0 | 10.0 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.7 | | | 0.6 | | 0.9 | 5.2 | | 1.5 | 1.5 | |
| Delay (s) | | 9.8 | | | 9.7 | | 10.0 | 17.1 | | 10.5 | 11.4 | |
| Level of Service | | A | | | A | | B | B | | B | B | |
| Approach Delay (s) | | 9.8 | | | 9.7 | | | 16.2 | | | 11.4 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 13.4 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.44 | | | |
| Actuated Cycle Length (s) | 50.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 54.9% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis
6: Old Fairhaven Pkwy & 12th St

2022 With Project AM Peak - Alt 4F
1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1556 | 1591 | | 1687 | 1634 | | 1770 | 1863 | 1583 | 1687 | 1760 | |
| Flt Permitted | 0.55 | 1.00 | | 0.52 | 1.00 | | 0.64 | 1.00 | 1.00 | 0.31 | 1.00 | |
| Satd. Flow (perm) | 895 | 1591 | | 929 | 1634 | | 1192 | 1863 | 1583 | 543 | 1760 | |
| Volume (vph) | 10 | 80 | 19 | 313 | 150 | 170 | 36 | 371 | 435 | 145 | 157 | 10 |
| Peak-hour factor, PHF | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Adj. Flow (vph) | 11 | 90 | 21 | 352 | 169 | 191 | 40 | 417 | 489 | 163 | 176 | 11 |
| RTOR Reduction (vph) | 0 | 12 | 0 | 0 | 53 | 0 | 0 | 0 | 314 | 0 | 3 | 0 |
| Lane Group Flow (vph) | 11 | 99 | 0 | 352 | 307 | 0 | 40 | 417 | 175 | 163 | 185 | 0 |
| Heavy Vehicles (%) | 16% | 16% | 16% | 7% | 7% | 7% | 2% | 2% | 2% | 7% | 7% | 7% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 12.9 | 11.9 | | 26.8 | 20.8 | | 27.4 | 24.2 | 24.2 | 29.8 | 25.4 | |
| Effective Green, g (s) | 14.9 | 12.9 | | 27.8 | 21.8 | | 29.4 | 25.2 | 25.2 | 31.8 | 26.4 | |
| Actuated g/C Ratio | 0.21 | 0.18 | | 0.39 | 0.31 | | 0.42 | 0.36 | 0.36 | 0.45 | 0.37 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 208 | 292 | | 484 | 506 | | 532 | 667 | 567 | 333 | 660 | |
| v/s Ratio Prot | 0.00 | 0.06 | | c0.11 | 0.19 | | 0.00 | c0.22 | | c0.04 | 0.10 | |
| v/s Ratio Perm | 0.01 | | | c0.17 | | | 0.03 | | 0.11 | 0.18 | | |
| v/c Ratio | 0.05 | 0.34 | | 0.73 | 0.61 | | 0.08 | 0.63 | 0.31 | 0.49 | 0.28 | |
| Uniform Delay, d1 | 22.0 | 25.0 | | 16.6 | 20.7 | | 12.2 | 18.7 | 16.3 | 12.7 | 15.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.7 | | 5.4 | 2.1 | | 0.1 | 4.4 | 1.4 | 1.1 | 1.1 | |
| Delay (s) | 22.1 | 25.7 | | 21.9 | 22.7 | | 12.3 | 23.1 | 17.7 | 13.9 | 16.4 | |
| Level of Service | C | C | | C | C | | B | C | B | B | B | |
| Approach Delay (s) | | 25.4 | | | 22.3 | | | 19.9 | | | 15.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 20.2 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.65 | | | |
| Actuated Cycle Length (s) | 70.4 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 61.6% | ICU Level of Service | B | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 4F
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.92 | | | | 0.99 | |
| Flt Protected | 0.95 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1782 | | | | | 1808 | 1640 | | | | 1604 | |
| Flt Permitted | 0.95 | | | | | 0.90 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1782 | | | | | 1622 | 1640 | | | | 1604 | |
| Volume (vph) | 205 | 7 | 5 | 5 | 7 | 462 | 159 | 65 | 245 | 5 | 215 | 20 |
| Peak-hour factor, PHF | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 266 | 9 | 6 | 6 | 9 | 600 | 206 | 84 | 258 | 5 | 226 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 281 | 0 | 0 | 0 | 0 | 615 | 508 | 0 | 0 | 0 | 247 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 3% | 5% | 5% | 8% | 8% | 4% | 12% | 12% | 12% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 14.5 | | | | | 24.3 | 24.3 | | | | 14.3 | |
| Effective Green, g (s) | 15.5 | | | | | 25.3 | 25.3 | | | | 15.3 | |
| Actuated g/C Ratio | 0.23 | | | | | 0.37 | 0.37 | | | | 0.22 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 406 | | | | | 603 | 609 | | | | 360 | |
| v/s Ratio Prot | c0.16 | | | | | | 0.31 | | | | c0.15 | |
| v/s Ratio Perm | | | | | | c0.38 | | | | | | |
| v/c Ratio | 0.69 | | | | | 1.02 | 0.83 | | | | 0.69 | |
| Uniform Delay, d1 | 24.1 | | | | | 21.4 | 19.5 | | | | 24.2 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 5.0 | | | | | 41.8 | 12.7 | | | | 5.4 | |
| Delay (s) | 29.2 | | | | | 63.2 | 32.2 | | | | 29.6 | |
| Level of Service | C | | | | | E | C | | | | C | |
| Approach Delay (s) | 29.2 | | | | | 63.2 | 32.2 | | | | 29.6 | |
| Approach LOS | C | | | | | E | C | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 42.5 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.84 | | | |
| Actuated Cycle Length (s) | 68.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 69.5% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project AM Peak - Alt 4F
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 5 | 0 | 5 | 10 | 0 | 67 | 5 | 155 | 2 | 15 | 110 | 5 |
| Peak Hour Factor | 0.78 | 0.92 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.92 | 0.92 | 0.78 | 0.78 |
| Hourly flow rate (vph) | 6 | 0 | 6 | 11 | 0 | 73 | 6 | 199 | 2 | 16 | 141 | 6 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 461 | 391 | 144 | 393 | 393 | 200 | 147 | | | 201 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 461 | 391 | 144 | 393 | 393 | 200 | 147 | | | 201 | | |
| tC, single (s) | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 | 4.2 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 | 2.3 | | | 2.2 | | |
| p0 queue free % | 99 | 100 | 99 | 98 | 100 | 91 | 100 | | | 99 | | |
| cM capacity (veh/h) | 464 | 536 | 908 | 556 | 535 | 841 | 1410 | | | 1371 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 13 | 11 | 73 | 6 | 201 | 16 | 147 |
| Volume Left | 6 | 11 | 0 | 6 | 0 | 16 | 0 |
| Volume Right | 6 | 0 | 73 | 0 | 2 | 0 | 6 |
| cSH | 614 | 556 | 841 | 1410 | 1700 | 1371 | 1700 |
| Volume to Capacity | 0.02 | 0.02 | 0.09 | 0.00 | 0.12 | 0.01 | 0.09 |
| Queue Length 95th (ft) | 2 | 1 | 7 | 0 | 0 | 1 | 0 |
| Control Delay (s) | 11.0 | 11.6 | 9.7 | 7.6 | 0.0 | 7.7 | 0.0 |
| Lane LOS | B | B | A | A | | A | |
| Approach Delay (s) | 11.0 | 9.9 | | 0.2 | | 0.8 | |
| Approach LOS | B | A | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.5 | | | |
| Intersection Capacity Utilization | 25.8% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

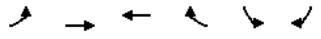
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 115 | 60 | 27 | 70 | 48 | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 125 | 65 | 29 | 76 | 52 | 35 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 168 | 29 | | | 29 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 168 | 29 | | | 29 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.2 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.3 | |
| p0 queue free % | 84 | 94 | | | 97 | |
| cM capacity (veh/h) | 787 | 1037 | | | 1533 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 125 | 65 | 29 | 76 | 87 |
| Volume Left | 125 | 0 | 0 | 0 | 52 |
| Volume Right | 0 | 65 | 0 | 76 | 0 |
| cSH | 787 | 1037 | 1700 | 1700 | 1533 |
| Volume to Capacity | 0.16 | 0.06 | 0.02 | 0.04 | 0.03 |
| Queue Length 95th (ft) | 14 | 5 | 0 | 0 | 3 |
| Control Delay (s) | 10.4 | 8.7 | 0.0 | 0.0 | 4.6 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 9.8 | | 0.0 | | 4.6 |
| Approach LOS | A | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 78 | 5 | 5 | 35 | 5 | 30 |
| Peak Hour Factor | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 |
| Hourly flow rate (vph) | 93 | 6 | 6 | 42 | 6 | 36 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | | | | 218 | 27 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | | | | 218 | 27 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.4 |
| p0 queue free % | 94 | | | | 99 | 97 |
| cM capacity (veh/h) | 1573 | | | | 712 | 1032 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 99 | 48 | 42 |
| Volume Left | 93 | 0 | 6 |
| Volume Right | 0 | 42 | 36 |
| cSH | 1573 | 1700 | 969 |
| Volume to Capacity | 0.06 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 5 | 0 | 3 |
| Control Delay (s) | 7.0 | 0.0 | 8.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 7.0 | 0.0 | 8.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.7 | | |
| Intersection Capacity Utilization | 21.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 25 | 142 | 222 | 10 | 35 | 105 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 27 | 154 | 241 | 11 | 38 | 114 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 437 | 247 | | | 252 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 437 | 247 | | | 252 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 95 | 81 | | | 97 | |
| cM capacity (veh/h) | 560 | 792 | | | 1313 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 182 | 252 | 152 |
| Volume Left | 27 | 0 | 38 |
| Volume Right | 154 | 11 | 0 |
| cSH | 746 | 1700 | 1313 |
| Volume to Capacity | 0.24 | 0.15 | 0.03 |
| Queue Length 95th (ft) | 24 | 0 | 2 |
| Control Delay (s) | 11.4 | 0.0 | 2.1 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.4 | 0.0 | 2.1 |
| Approach LOS | B | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 4.1 | | |
| Intersection Capacity Utilization | | 39.9% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |

HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 4F
1: Old Fairhaven Pkwy & I-5 NB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 844 | 342 | 0 | 0 | 230 | 55 | 216 | 0 | 20 | 0 | 0 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 908 | 368 | 0 | 0 | 247 | 59 | 232 | 0 | 22 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | 286 | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 306 | | | 368 | | | 2460 | 2489 | 368 | 2481 | 2460 | 277 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 306 | | | 368 | | | 2460 | 2489 | 368 | 2481 | 2460 | 277 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 28 | | | 100 | | | 0 | 100 | 97 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1254 | | | 1196 | | | 9 | 8 | 678 | 8 | 9 | 767 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | NB 2 |
|---|---|---|---|---|---|
| Volume Total | 908 | 368 | 306 | 232 | 22 |
| Volume Left | 908 | 0 | 0 | 232 | 0 |
| Volume Right | 0 | 0 | 59 | 0 | 22 |
| cSH | 1254 | 1700 | 1700 | 9 | 678 |
| Volume to Capacity | 0.72 | 0.22 | 0.18 | 27.11 | 0.03 |
| Queue Length 95th (ft) | 170 | 0 | 0 | Err | 2 |
| Control Delay (s) | 15.0 | 0.0 | 0.0 | Err | 10.5 |
| Lane LOS | B | | | F | B |
| Approach Delay (s) | 10.7 | | 0.0 | 9152.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 1272.8 | | | |
| Intersection Capacity Utilization | 136.3% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 4F
2: Old Fairhaven Pkwy & I-5 SB Ramps — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | |
| 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 | | 1.00 | 1.00 | 0.95 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1863 | 1583 | 1787 | 1881 | | | | | 1770 | 1583 | |
| Flt Permitted | | 1.00 | 1.00 | 0.17 | 1.00 | | | | | 0.95 | 1.00 | |
| Satd. Flow (perm) | | 1863 | 1583 | 315 | 1881 | | | | | 1770 | 1583 | |
| Volume (vph) | 0 | 1011 | 196 | 20 | 396 | 0 | 0 | 0 | 0 | 80 | 0 | 858 |
| Peak-hour factor, PHF | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Adj. Flow (vph) | 0 | 1042 | 202 | 21 | 408 | 0 | 0 | 0 | 0 | 82 | 0 | 885 |
| RTOR Reduction (vph) | 0 | 0 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 437 | 0 |
| Lane Group Flow (vph) | 0 | 1042 | 66 | 21 | 408 | 0 | 0 | 0 | 0 | 82 | 448 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% | 2% | 2% | 2% |
| Turn Type | | | custom | Perm | | | | | | Perm | | |
| Protected Phases | | 2 | 5 | | 6 | | | | | | 4 | |
| Permitted Phases | | | | 6 | | | | | | 4 | | |
| Actuated Green, G (s) | | 36.5 | 8.6 | 22.9 | 22.9 | | | | | 17.0 | 17.0 | |
| Effective Green, g (s) | | 37.5 | 9.6 | 23.9 | 23.9 | | | | | 18.0 | 18.0 | |
| Actuated g/C Ratio | | 0.59 | 0.15 | 0.38 | 0.38 | | | | | 0.28 | 0.28 | |
| Clearance Time (s) | | 5.0 | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 1100 | 239 | 119 | 708 | | | | | 502 | 449 | |
| v/s Ratio Prot | | c0.56 | 0.04 | | 0.22 | | | | | | c0.28 | |
| v/s Ratio Perm | | | | 0.07 | | | | | | 0.05 | | |
| v/c Ratio | | 0.95 | 0.28 | 0.18 | 0.58 | | | | | 0.16 | 1.00 | |
| Uniform Delay, d1 | | 12.1 | 23.9 | 13.2 | 15.8 | | | | | 17.1 | 22.7 | |
| Progression Factor | | 1.00 | 1.00 | 1.00 | 1.00 | | | | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 15.9 | 0.6 | 0.7 | 1.1 | | | | | 0.2 | 41.5 | |
| Delay (s) | | 28.0 | 24.5 | 13.9 | 16.9 | | | | | 17.2 | 64.3 | |
| Level of Service | | C | C | B | B | | | | | B | E | |
| Approach Delay (s) | | 27.4 | | | 16.8 | | | 0.0 | | | 60.3 | |
| Approach LOS | | C | | | B | | | A | | | E | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 37.7 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.96 | | | |
| Actuated Cycle Length (s) | 63.5 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 136.3% | ICU Level of Service | H | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | 1.00 | 0.99 | | 1.00 | 0.99 | | 1.00 | 0.90 | | 1.00 | 0.92 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 1845 | | 1770 | 1840 | | 1787 | 1688 | | 1770 | 1707 | |
| Flt Permitted | 0.08 | 1.00 | | 0.08 | 1.00 | | 0.56 | 1.00 | | 0.59 | 1.00 | |
| Satd. Flow (perm) | 151 | 1845 | | 151 | 1840 | | 1063 | 1688 | | 1091 | 1707 | |
| Volume (vph) | 80 | 841 | 55 | 113 | 911 | 80 | 55 | 46 | 101 | 230 | 70 | 87 |
| Peak-hour factor, PHF | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Adj. Flow (vph) | 85 | 895 | 59 | 120 | 969 | 85 | 59 | 49 | 107 | 245 | 74 | 93 |
| RTOR Reduction (vph) | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 81 | 0 | 0 | 51 | 0 |
| Lane Group Flow (vph) | 85 | 951 | 0 | 120 | 1050 | 0 | 59 | 75 | 0 | 245 | 116 | 0 |
| Heavy Vehicles (%) | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 2% | 2% | 2% |
| Turn Type | pm+pt | | | pm+pt | | | Perm | | | Perm | | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | 52.8 | 48.2 | | 52.8 | 48.2 | | 20.3 | 20.3 | | 20.3 | 20.3 | |
| Effective Green, g (s) | 54.8 | 49.2 | | 54.8 | 49.2 | | 21.3 | 21.3 | | 21.3 | 21.3 | |
| Actuated g/C Ratio | 0.62 | 0.56 | | 0.62 | 0.56 | | 0.24 | 0.24 | | 0.24 | 0.24 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | 0.2 | 3.0 | | 0.2 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 197 | 1030 | | 197 | 1028 | | 257 | 408 | | 264 | 413 | |
| v/s Ratio Prot | 0.03 | 0.52 | | c0.04 | c0.57 | | | 0.04 | | | 0.07 | |
| v/s Ratio Perm | 0.24 | | | 0.34 | | | 0.06 | | | c0.22 | | |
| v/c Ratio | 0.43 | 0.92 | | 0.61 | 1.02 | | 0.23 | 0.18 | | 0.93 | 0.28 | |
| Uniform Delay, d1 | 20.3 | 17.7 | | 17.4 | 19.4 | | 26.8 | 26.5 | | 32.7 | 27.2 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 13.3 | | 3.6 | 33.7 | | 0.5 | 0.2 | | 36.2 | 0.4 | |
| Delay (s) | 20.9 | 31.0 | | 21.0 | 53.2 | | 27.3 | 26.7 | | 68.9 | 27.5 | |
| Level of Service | C | C | | C | D | | C | C | | E | C | |
| Approach Delay (s) | | 30.2 | | | 49.9 | | | 26.9 | | | 52.1 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 41.3 | HCM Level of Service | D | |
| HCM Volume to Capacity ratio | 0.97 | | | |
| Actuated Cycle Length (s) | 88.1 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 92.5% | ICU Level of Service | F | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



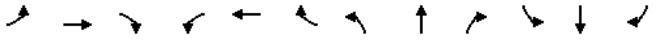


| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 11 | 961 | 10 | 30 | 983 | 50 | 10 | 5 | 20 | 55 | 5 | 17 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Hourly flow rate (vph) | 11 | 981 | 10 | 31 | 1003 | 51 | 10 | 5 | 20 | 56 | 5 | 17 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 1054 | | | 991 | | | 2092 | 2123 | 986 | 2116 | 2103 | 1029 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 1054 | | | 991 | | | 2092 | 2123 | 986 | 2116 | 2103 | 1029 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 98 | | | 96 | | | 68 | 89 | 93 | 0 | 90 | 94 |
| cM capacity (veh/h) | 660 | | | 702 | | | 31 | 47 | 299 | 30 | 49 | 287 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 11 | 991 | 31 | 1054 | 15 | 20 | 61 | 17 |
| Volume Left | 11 | 0 | 31 | 0 | 10 | 0 | 56 | 0 |
| Volume Right | 0 | 10 | 0 | 51 | 0 | 20 | 0 | 17 |
| cSH | 660 | 1700 | 702 | 1700 | 35 | 299 | 31 | 287 |
| Volume to Capacity | 0.02 | 0.58 | 0.04 | 0.62 | 0.43 | 0.07 | 1.94 | 0.06 |
| Queue Length 95th (ft) | 1 | 0 | 3 | 0 | 36 | 5 | 175 | 5 |
| Control Delay (s) | 10.5 | 0.0 | 10.4 | 0.0 | 169.6 | 17.9 | 713.1 | 18.4 |
| Lane LOS | B | | B | | F | C | F | C |
| Approach Delay (s) | 0.1 | | 0.3 | | 82.9 | | 559.7 | |
| Approach LOS | | | | | F | | F | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 21.5 | | | |
| Intersection Capacity Utilization | 71.4% | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | |

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 4F
5: Harris Ave & 12th St — 1/30/2009



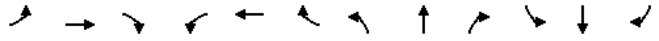
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Frt | | 0.96 | | | 0.96 | | 1.00 | 0.97 | | 1.00 | 0.99 | |
| Flt Protected | | 0.98 | | | 0.98 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1794 | | | 1767 | | 1805 | 1849 | | 1805 | 1880 | |
| Flt Permitted | | 0.78 | | | 0.83 | | 0.17 | 1.00 | | 0.32 | 1.00 | |
| Satd. Flow (perm) | | 1422 | | | 1487 | | 317 | 1849 | | 599 | 1880 | |
| Volume (vph) | 130 | 100 | 85 | 75 | 100 | 65 | 90 | 390 | 85 | 120 | 583 | 45 |
| Peak-hour factor, PHF | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Adj. Flow (vph) | 143 | 110 | 93 | 82 | 110 | 71 | 99 | 429 | 93 | 132 | 641 | 49 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 14 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 0 | 322 | 0 | 0 | 239 | 0 | 99 | 508 | 0 | 132 | 685 | 0 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | 0% | 0% |
| Turn Type | Perm | | | Perm | | | Perm | | | Perm | | |
| Protected Phases | | 2 | | | 6 | | | 8 | | | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |
| Actuated Green, G (s) | | 21.0 | | | 21.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Effective Green, g (s) | | 22.0 | | | 22.0 | | 25.0 | 25.0 | | 25.0 | 25.0 | |
| Actuated g/C Ratio | | 0.40 | | | 0.40 | | 0.45 | 0.45 | | 0.45 | 0.45 | |
| Clearance Time (s) | | 5.0 | | | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 569 | | | 595 | | 144 | 840 | | 272 | 855 | |
| v/s Ratio Prot | | | | | | | | 0.27 | | | c0.36 | |
| v/s Ratio Perm | | c0.23 | | | 0.16 | | 0.31 | | | 0.22 | | |
| v/c Ratio | | 0.57 | | | 0.40 | | 0.69 | 0.60 | | 0.49 | 0.80 | |
| Uniform Delay, d1 | | 12.8 | | | 11.8 | | 11.9 | 11.3 | | 10.5 | 12.9 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 4.0 | | | 2.0 | | 23.6 | 3.2 | | 6.1 | 7.8 | |
| Delay (s) | | 16.8 | | | 13.8 | | 35.5 | 14.5 | | 16.6 | 20.7 | |
| Level of Service | | B | | | B | | D | B | | B | C | |
| Approach Delay (s) | | 16.8 | | | 13.8 | | | 17.8 | | | 20.0 | |
| Approach LOS | | B | | | B | | | B | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 18.0 | HCM Level of Service | B | |
| HCM Volume to Capacity ratio | 0.69 | | | |
| Actuated Cycle Length (s) | 55.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 74.5% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 4F
6: Old Fairhaven Pkwy & 12th St — 1/30/2009



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lane Util. Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.97 | | 1.00 | 0.90 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1703 | 1743 | | 1787 | 1689 | | 1805 | 1900 | 1615 | 1787 | 1868 | |
| Flt Permitted | 0.36 | 1.00 | | 0.41 | 1.00 | | 0.36 | 1.00 | 1.00 | 0.37 | 1.00 | |
| Satd. Flow (perm) | 653 | 1743 | | 765 | 1689 | | 688 | 1900 | 1615 | 689 | 1868 | |
| Volume (vph) | 10 | 160 | 36 | 368 | 120 | 255 | 33 | 295 | 254 | 295 | 428 | 20 |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 11 | 172 | 39 | 396 | 129 | 274 | 35 | 317 | 273 | 317 | 460 | 22 |
| RTOR Reduction (vph) | 0 | 11 | 0 | 0 | 94 | 0 | 0 | 0 | 179 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 11 | 200 | 0 | 396 | 309 | 0 | 35 | 317 | 94 | 317 | 480 | 0 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 1% | 1% | 1% | 0% | 0% | 0% | 1% | 1% | 1% |
| Turn Type | pm+pt | | | pm+pt | | | pm+pt | | Perm | pm+pt | | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | 2 | 6 | | |
| Actuated Green, G (s) | 18.9 | 17.8 | | 29.8 | 23.7 | | 28.4 | 26.2 | 26.2 | 39.2 | 32.0 | |
| Effective Green, g (s) | 20.9 | 18.8 | | 30.8 | 24.7 | | 30.4 | 27.2 | 27.2 | 40.2 | 33.0 | |
| Actuated g/C Ratio | 0.26 | 0.24 | | 0.39 | 0.31 | | 0.38 | 0.34 | 0.34 | 0.51 | 0.42 | |
| Clearance Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 201 | 415 | | 402 | 528 | | 310 | 654 | 556 | 476 | 780 | |
| v/s Ratio Prot | 0.00 | 0.11 | | c0.10 | 0.18 | | 0.00 | 0.17 | | c0.08 | 0.26 | |
| v/s Ratio Perm | 0.01 | | | c0.28 | | | 0.04 | | 0.06 | c0.26 | | |
| v/c Ratio | 0.05 | 0.48 | | 0.99 | 0.58 | | 0.11 | 0.48 | 0.17 | 0.67 | 0.62 | |
| Uniform Delay, d1 | 21.7 | 25.9 | | 23.1 | 22.8 | | 15.6 | 20.4 | 18.0 | 12.7 | 18.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | 0.9 | | 40.6 | 1.7 | | 0.2 | 2.6 | 0.7 | 3.5 | 3.6 | |
| Delay (s) | 21.8 | 26.8 | | 63.7 | 24.5 | | 15.7 | 22.9 | 18.7 | 16.2 | 21.7 | |
| Level of Service | C | C | | E | C | | B | C | B | B | C | |
| Approach Delay (s) | | 26.6 | | | 43.9 | | | 20.7 | | | 19.5 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 28.4 | HCM Level of Service | C | |
| HCM Volume to Capacity ratio | 0.78 | | | |
| Actuated Cycle Length (s) | 79.0 | Sum of lost time (s) | 8.0 | |
| Intersection Capacity Utilization | 76.2% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 4F
7: Hawthorne & 12th St — 1/30/2009

| Movement | EBL | EBR | EBR2 | NBL2 | NBL | NBT | SBT | SBR | SBR2 | NEL2 | NEL | NER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | | | | | 4.0 | 4.0 | | | | 4.0 | |
| Lane Util. Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Frt | 0.99 | | | | | 1.00 | 0.95 | | | | 0.99 | |
| Flt Protected | 0.96 | | | | | 1.00 | 1.00 | | | | 0.96 | |
| Satd. Flow (prot) | 1780 | | | | | 1861 | 1793 | | | | 1800 | |
| Flt Permitted | 0.96 | | | | | 0.57 | 1.00 | | | | 0.96 | |
| Satd. Flow (perm) | 1780 | | | | | 1065 | 1793 | | | | 1800 | |
| Volume (vph) | 155 | 6 | 5 | 5 | 6 | 462 | 617 | 75 | 255 | 5 | 150 | 10 |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 168 | 7 | 5 | 5 | 7 | 502 | 671 | 82 | 277 | 5 | 163 | 11 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 180 | 0 | 0 | 0 | 0 | 514 | 1017 | 0 | 0 | 0 | 177 | 0 |
| Heavy Vehicles (%) | 1% | 1% | 4% | 2% | 2% | 2% | 1% | 1% | 1% | 0% | 0% | 0% |
| Turn Type | | | | Perm | Perm | | | | | Split | | |
| Protected Phases | 7 | | | | | 2 | 6 | | | 8 | 8 | |
| Permitted Phases | | | | 2 | 2 | | | | | | | |
| Actuated Green, G (s) | 12.9 | | | | | 39.3 | 39.3 | | | | 12.7 | |
| Effective Green, g (s) | 13.9 | | | | | 40.3 | 40.3 | | | | 13.7 | |
| Actuated g/C Ratio | 0.17 | | | | | 0.50 | 0.50 | | | | 0.17 | |
| Clearance Time (s) | 5.0 | | | | | 5.0 | 5.0 | | | | 5.0 | |
| Vehicle Extension (s) | 3.0 | | | | | 3.0 | 3.0 | | | | 3.0 | |
| Lane Grp Cap (vph) | 310 | | | | | 537 | 904 | | | | 309 | |
| v/s Ratio Prot | c0.10 | | | | | | c0.57 | | | | c0.10 | |
| v/s Ratio Perm | | | | | | 0.48 | | | | | | |
| v/c Ratio | 0.58 | | | | | 0.96 | 1.13 | | | | 0.57 | |
| Uniform Delay, d1 | 30.3 | | | | | 19.0 | 19.8 | | | | 30.4 | |
| Progression Factor | 1.00 | | | | | 1.00 | 1.00 | | | | 1.00 | |
| Incremental Delay, d2 | 2.8 | | | | | 28.1 | 70.6 | | | | 2.5 | |
| Delay (s) | 33.1 | | | | | 47.0 | 90.4 | | | | 32.9 | |
| Level of Service | C | | | | | D | F | | | | C | |
| Approach Delay (s) | 33.1 | | | | | 47.0 | 90.4 | | | | 32.9 | |
| Approach LOS | C | | | | | D | F | | | | C | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| HCM Average Control Delay | 67.9 | HCM Level of Service | E | |
| HCM Volume to Capacity ratio | 0.90 | | | |
| Actuated Cycle Length (s) | 79.9 | Sum of lost time (s) | 12.0 | |
| Intersection Capacity Utilization | 81.0% | ICU Level of Service | D | |
| Analysis Period (min) | 15 | | | |

c Critical Lane Group



HCM Unsignalized Intersection Capacity Analysis — 2022 With Project PM Peak - Alt 4F
8: Viewcrest & Chuckanut Dr — 1/30/2009

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Free | | | Free | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 10 | 0 | 10 | 5 | 0 | 33 | 10 | 250 | 10 | 65 | 215 | 5 |
| Peak Hour Factor | 0.95 | 0.92 | 0.95 | 0.92 | 0.92 | 0.92 | 0.95 | 0.95 | 0.92 | 0.92 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 0 | 11 | 5 | 0 | 36 | 11 | 263 | 11 | 71 | 226 | 5 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 690 | 665 | 229 | 668 | 663 | 269 | 232 | | | 274 | | |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 690 | 665 | 229 | 668 | 663 | 269 | 232 | | | 274 | | |
| tC, single (s) | 7.2 | 6.5 | 6.3 | 7.1 | 6.5 | 6.2 | 4.1 | | | 4.1 | | |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 3.6 | 4.0 | 3.4 | 3.5 | 4.0 | 3.3 | 2.2 | | | 2.2 | | |
| p0 queue free % | 97 | 100 | 99 | 98 | 100 | 95 | 99 | | | 95 | | |
| cM capacity (veh/h) | 321 | 357 | 800 | 350 | 358 | 770 | 1336 | | | 1289 | | |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 21 | 5 | 36 | 11 | 274 | 71 | 232 |
| Volume Left | 11 | 5 | 0 | 11 | 0 | 71 | 0 |
| Volume Right | 11 | 0 | 36 | 0 | 11 | 0 | 5 |
| cSH | 459 | 350 | 770 | 1336 | 1700 | 1289 | 1700 |
| Volume to Capacity | 0.05 | 0.02 | 0.05 | 0.01 | 0.16 | 0.05 | 0.14 |
| Queue Length 95th (ft) | 4 | 1 | 4 | 1 | 0 | 4 | 0 |
| Control Delay (s) | 13.2 | 15.5 | 9.9 | 7.7 | 0.0 | 8.0 | 0.0 |
| Lane LOS | B | C | A | A | | A | |
| Approach Delay (s) | 13.2 | 10.6 | | 0.3 | | 1.9 | |
| Approach LOS | B | B | | | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 2.1 | | | |
| Intersection Capacity Utilization | 35.2% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

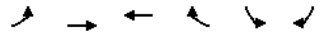
| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 180 | 78 | 47 | 150 | 67 | 43 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 191 | 83 | 50 | 160 | 71 | 46 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 238 | 50 | | | 50 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 238 | 50 | | | 50 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 73 | 92 | | | 95 | |
| cM capacity (veh/h) | 718 | 1021 | | | 1550 | |

| Direction, Lane # | WB 1 | WB 2 | NB 1 | NB 2 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 191 | 83 | 50 | 160 | 117 |
| Volume Left | 191 | 0 | 0 | 0 | 71 |
| Volume Right | 0 | 83 | 0 | 160 | 0 |
| cSH | 718 | 1021 | 1700 | 1700 | 1550 |
| Volume to Capacity | 0.27 | 0.08 | 0.03 | 0.09 | 0.05 |
| Queue Length 95th (ft) | 27 | 7 | 0 | 0 | 4 |
| Control Delay (s) | 11.8 | 8.8 | 0.0 | 0.0 | 4.7 |
| Lane LOS | B | A | | | A |
| Approach Delay (s) | 10.9 | | 0.0 | | 4.7 |
| Approach LOS | B | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.9 | | |
| Intersection Capacity Utilization | 29.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Volume (veh/h) | 62 | 10 | 5 | 5 | 45 | 68 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Hourly flow rate (vph) | 71 | 11 | 6 | 6 | 52 | 78 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 11 | | | | 163 | 9 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 11 | | | | 163 | 9 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 96 | | | | 93 | 93 |
| cM capacity (veh/h) | 1595 | | | | 796 | 1079 |

| Direction, Lane # | EB 1 | WB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 83 | 11 | 130 |
| Volume Left | 71 | 0 | 52 |
| Volume Right | 0 | 6 | 78 |
| cSH | 1595 | 1700 | 945 |
| Volume to Capacity | 0.04 | 0.01 | 0.14 |
| Queue Length 95th (ft) | 4 | 0 | 12 |
| Control Delay (s) | 6.4 | 0.0 | 9.4 |
| Lane LOS | A | | A |
| Approach Delay (s) | 6.4 | 0.0 | 9.4 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 7.8 | | |
| Intersection Capacity Utilization | 24.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Volume (veh/h) | 15 | 73 | 263 | 25 | 138 | 270 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 79 | 286 | 27 | 150 | 293 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 893 | 299 | | | 313 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 893 | 299 | | | 313 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 94 | 89 | | | 88 | |
| cM capacity (veh/h) | 275 | 740 | | | 1247 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 96 | 313 | 443 |
| Volume Left | 16 | 0 | 150 |
| Volume Right | 79 | 27 | 0 |
| cSH | 574 | 1700 | 1247 |
| Volume to Capacity | 0.17 | 0.18 | 0.12 |
| Queue Length 95th (ft) | 15 | 0 | 10 |
| Control Delay (s) | 12.5 | 0.0 | 3.6 |
| Lane LOS | B | | A |
| Approach Delay (s) | 12.5 | 0.0 | 3.6 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.3 | | |
| Intersection Capacity Utilization | 52.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |