

Alternative E: Direct Connector Kingwood to US 59
 1: Trailwood Village Dr. & Kingwood Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | ø2 | ø3 | ø4 | ø5 | ø7 | ø8 |
|----------------------------|-------|-------|-------|-------|-------|-------|----|----|----|----|----|----|
| Lane Configurations | ↑↑ | ↑ | ↓ | ↑↑ | ↓ | ↓ | | | | | | |
| Volume (vph) | 2095 | 86 | 60 | 1237 | 79 | 47 | | | | | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | | | | | |
| Storage Length (ft) | | 150 | 150 | | 0 | 0 | | | | | | |
| Storage Lanes | | 1 | 1 | | 1 | 1 | | | | | | |
| Taper Length (ft) | | | 25 | | 25 | | | | | | | |
| Lane Util. Factor | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 0.95 | | | | | | |
| Frt | | 0.850 | | | 0.992 | 0.850 | | | | | | |
| Flt Protected | | | 0.950 | | 0.955 | | | | | | | |
| Satd. Flow (prot) | 3539 | 1583 | 1770 | 3539 | 1765 | 1504 | | | | | | |
| Flt Permitted | | | 0.950 | | 0.955 | | | | | | | |
| Satd. Flow (perm) | 3539 | 1583 | 1770 | 3539 | 1765 | 1504 | | | | | | |
| Right Turn on Red | | Yes | | | | Yes | | | | | | |
| Satd. Flow (RTOR) | | 36 | | | 2 | 54 | | | | | | |
| Link Speed (mph) | 40 | | | 40 | 30 | | | | | | | |
| Link Distance (ft) | 272 | | | 542 | 1092 | | | | | | | |
| Travel Time (s) | 4.6 | | | 9.2 | 24.8 | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | | | | | | |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | | | | | | |
| Adj. Flow (vph) | 2664 | 109 | 76 | 1573 | 100 | 60 | | | | | | |
| Shared Lane Traffic (%) | | | | | | 10% | | | | | | |
| Lane Group Flow (vph) | 2664 | 109 | 76 | 1573 | 106 | 54 | | | | | | |
| Enter Blocked Intersection | No | No | No | No | No | No | | | | | | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | | | | | | |
| Median Width(ft) | 40 | | | 40 | 12 | | | | | | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | | | | | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | | | | | | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | | | |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 | | | | | | |
| Number of Detectors | 2 | 1 | 1 | 2 | 1 | 1 | | | | | | |
| Detector Template | Thru | Right | Left | Thru | Left | Right | | | | | | |
| Leading Detector (ft) | 100 | 20 | 20 | 100 | 20 | 20 | | | | | | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Detector 1 Size(ft) | 6 | 20 | 20 | 6 | 20 | 20 | | | | | | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | | | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| Detector 2 Position(ft) | 94 | | | 94 | | | | | | | | |
| Detector 2 Size(ft) | 6 | | | 6 | | | | | | | | |
| Detector 2 Type | Cl+Ex | | | Cl+Ex | | | | | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | 0.0 | | | 0.0 | | | | | | | | |
| Turn Type | NA | Perm | Prot | NA | NA | Perm | | | | | | |
| Protected Phases | 2 7 | | 1 | 6 | 8 3 | | 2 | 3 | 4 | 5 | 7 | 8 |
| Permitted Phases | | 2 7 | | | | 8 3 | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 1: Trailwood Village Dr. & Kingwood Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | ø2 | ø3 | ø4 | ø5 | ø7 | ø8 |
|-------------------------|------|------|-------|-------|------|------|-------|------|------|------|------|------|
| Detector Phase | 2 7 | 2 7 | 1 | 6 | 8 3 | 8 3 | | | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | 3.0 | 2.0 | | | 10.0 | 1.0 | 5.0 | 3.0 | 1.0 | 5.0 |
| Minimum Split (s) | | | 10.0 | 21.0 | | | 29.5 | 14.0 | 10.0 | 9.0 | 8.0 | 21.0 |
| Total Split (s) | | | 10.0 | 87.0 | | | 109.0 | 21.0 | 10.0 | 32.0 | 10.0 | 21.0 |
| Total Split (%) | | | 6.7% | 58.0% | | | 73% | 14% | 7% | 21% | 7% | 14% |
| Maximum Green (s) | | | 4.0 | 82.0 | | | 96.0 | 8.0 | 5.0 | 26.0 | 5.0 | 16.0 |
| Yellow Time (s) | | | 4.0 | 4.0 | | | 4.0 | 3.5 | 3.5 | 4.0 | 3.5 | 3.5 |
| All-Red Time (s) | | | 2.0 | 1.0 | | | 9.0 | 9.5 | 1.5 | 2.0 | 1.5 | 1.5 |
| Lost Time Adjust (s) | | | 0.0 | 0.0 | | | | | | | | |
| Total Lost Time (s) | | | 6.0 | 5.0 | | | | | | | | |
| Lead/Lag | | | Lag | Lag | | | Lead | | | Lead | | |
| Lead-Lag Optimize? | | | Yes | Yes | | | Yes | | | Yes | | |
| Vehicle Extension (s) | | | 0.2 | 0.2 | | | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Recall Mode | | | None | C-Max | | | C-Max | Max | None | None | None | Max |
| Walk Time (s) | | | | 5.0 | | | 5.0 | | | | | |
| Flash Dont Walk (s) | | | | 11.0 | | | 11.0 | | | | | |
| Pedestrian Calls (#/hr) | | | | 0 | | | 0 | | | | | |
| Act Effect Green (s) | 96.0 | 96.0 | 4.0 | 86.3 | 16.0 | 16.0 | | | | | | |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.03 | 0.58 | 0.11 | 0.11 | | | | | | |
| v/c Ratio | 1.18 | 0.11 | 1.62 | 0.77 | 0.56 | 0.26 | | | | | | |
| Control Delay | 90.1 | 0.5 | 371.9 | 31.4 | 74.5 | 17.8 | | | | | | |
| Queue Delay | 0.1 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | |
| Total Delay | 90.1 | 2.0 | 371.9 | 31.4 | 74.5 | 17.8 | | | | | | |
| LOS | F | A | F | C | E | B | | | | | | |
| Approach Delay | 86.7 | | | 47.1 | 55.3 | | | | | | | |
| Approach LOS | F | | | D | E | | | | | | | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.62
 Intersection Signal Delay: 71.3
 Intersection LOS: E
 Intersection Capacity Utilization 89.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Trailwood Village Dr. & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
4: Green Oak Dr. & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|------|------|-------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 36 | 1809 | 82 | 0 | 0 | 0 | 0 | 172 | 163 | 304 | 92 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 150 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 0 | | 1 | 1 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Fr _t | | | 0.850 | | | | | | 0.850 | | | |
| Fl _t Protected | 0.950 | | | | | | | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Fl _t Permitted | 0.950 | | | | | | | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 138 | | | | | | 145 | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 2489 | | | 1560 | | | 515 | | | 89 | |
| Travel Time (s) | | 56.6 | | | 35.5 | | | 11.7 | | | 2.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% |
| Adj. Flow (vph) | 46 | 2301 | 104 | 0 | 0 | 0 | 0 | 219 | 207 | 387 | 117 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 46 | 2301 | 104 | 0 | 0 | 0 | 0 | 219 | 207 | 387 | 117 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | | | | | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | Right | | | | | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | | | | | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | | | | | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | | | | | NA | Perm | Prot | NA | |
| Protected Phases | 15 | 2 | | | | | | 8 | | 1 4 | 4 | |
| Permitted Phases | | | 2 | | | | | | | 8 | | |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 4: Green Oak Dr. & Kingwood Dr.

PM Peak Hour

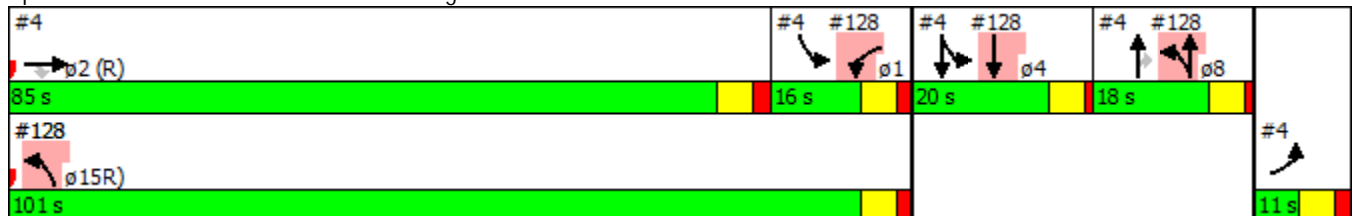


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-----|-----|-----|-----|-------|-------|-------|-------|-----|
| Detector Phase | 15 | 2 | 2 | | | | | 8 | 8 | 14 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 4.0 | 4.0 | | | | | 5.0 | 5.0 | | 5.0 | |
| Minimum Split (s) | 11.0 | 20.0 | 20.0 | | | | | 18.0 | 18.0 | | 10.0 | |
| Total Split (s) | 11.0 | 85.0 | 85.0 | | | | | 18.0 | 18.0 | | 20.0 | |
| Total Split (%) | 7.3% | 56.7% | 56.7% | | | | | 12.0% | 12.0% | | 13.3% | |
| Maximum Green (s) | 5.0 | 79.0 | 79.0 | | | | | 13.0 | 13.0 | | 15.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | | | | 1.0 | 1.0 | | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | | | | 5.0 | 5.0 | | 5.0 | |
| Lead/Lag | | Lead | Lead | | | | | Lag | Lag | | Lead | |
| Lead-Lag Optimize? | | Yes | Yes | | | | | Yes | Yes | | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | None | C-Max | C-Max | | | | | None | None | | None | |
| Walk Time (s) | | 4.0 | 4.0 | | | | | 6.0 | 6.0 | | | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | | | | 7.0 | 7.0 | | | |
| Pedestrian Calls (#/hr) | | 0 | 0 | | | | | 0 | 0 | | | |
| Act Effect Green (s) | 5.0 | 79.0 | 79.0 | | | | | 13.0 | 13.0 | 30.0 | 15.0 | |
| Actuated g/C Ratio | 0.03 | 0.53 | 0.53 | | | | | 0.09 | 0.09 | 0.20 | 0.10 | |
| v/c Ratio | 0.78 | 1.24 | 0.12 | | | | | 1.36 | 0.77 | 1.09 | 0.63 | |
| Control Delay | 135.5 | 143.2 | 1.2 | | | | | 245.2 | 40.6 | 103.2 | 19.1 | |
| Queue Delay | 69.3 | 0.0 | 0.0 | | | | | 0.5 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 204.8 | 143.2 | 1.2 | | | | | 245.7 | 40.6 | 103.2 | 19.1 | |
| LOS | F | F | A | | | | | F | D | F | B | |
| Approach Delay | | 138.3 | | | | | | 146.0 | | | 83.7 | |
| Approach LOS | | F | | | | | | F | | | F | |

Intersection Summary

| | |
|------------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 117 (78%), Referenced to phase 2:EBT and 6:, Start of Green |
| Natural Cycle: | 150 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.40 |
| Intersection Signal Delay: | 131.1 |
| Intersection LOS: | F |
| Intersection Capacity Utilization: | 132.5% |
| ICU Level of Service: | H |
| Analysis Period (min): | 15 |

Splits and Phases: 4: Green Oak Dr. & Kingwood Dr.



| Lane Group | ø1 | ø6 |
|-------------------------|------|-------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 4.0 |
| Minimum Split (s) | 11.0 | 10.0 |
| Total Split (s) | 16.0 | 101.0 |
| Total Split (%) | 11% | 67% |
| Maximum Green (s) | 10.0 | 95.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | C-Max |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 6: Northpark Dr. & Sorters

PM Peak Hour



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|------|-------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 49 | 327 | 326 | 0 | 196 | 114 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | | | |
| Flt Protected | 0.950 | | | | | 0.969 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | 0 | 0 | 1805 |
| Flt Permitted | 0.950 | | | | | 0.969 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | 0 | 0 | 1805 |
| Link Speed (mph) | 40 | | 30 | | | 35 |
| Link Distance (ft) | 1488 | | 70 | | | 496 |
| Travel Time (s) | 25.4 | | 1.6 | | | 9.7 |
| Peak Hour Factor | 0.61 | 0.94 | 0.92 | 0.92 | 0.83 | 0.84 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 91 | 393 | 400 | 0 | 267 | 153 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 91 | 393 | 400 | 0 | 0 | 420 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 20 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Stop | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 51.8% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
 8: Lake Houston Pkwy/Lake Houston Pkwy & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 105 | 657 | 533 | 230 | 362 | 32 | 567 | 293 | 298 | 22 | 198 | 91 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 150 | 150 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 2 | | 0 | 2 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 0.97 | 0.95 | 0.95 | 0.97 | 0.95 | 0.95 |
| Fr _t | | | 0.850 | | 0.985 | | | 0.923 | | | 0.951 | |
| Fl _t Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3486 | 0 | 3433 | 3267 | 0 | 3433 | 3366 | 0 |
| Fl _t Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3486 | 0 | 3433 | 3267 | 0 | 3433 | 3366 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 397 | | 9 | | | 190 | | | 48 | |
| Link Speed (mph) | | 45 | | | 40 | | | 40 | | | 40 | |
| Link Distance (ft) | | 2785 | | | 2651 | | | 1043 | | | 1141 | |
| Travel Time (s) | | 42.2 | | | 45.2 | | | 17.8 | | | 19.4 | |
| Peak Hour Factor | 0.88 | 0.94 | 0.90 | 0.89 | 0.87 | 0.67 | 0.94 | 0.86 | 0.83 | 0.69 | 0.85 | 0.81 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 135 | 790 | 669 | 292 | 470 | 54 | 682 | 385 | 406 | 36 | 263 | 127 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 135 | 790 | 669 | 292 | 524 | 0 | 682 | 791 | 0 | 36 | 390 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | 2 | | | | | | | | | |
| Minimum Split (s) | 13.0 | 21.0 | 21.0 | 13.0 | 21.0 | | 13.0 | 21.0 | | 13.0 | 21.0 | |
| Total Split (s) | 25.0 | 54.0 | 54.0 | 25.0 | 54.0 | | 36.0 | 56.0 | | 15.0 | 22.0 | |
| Total Split (%) | 16.7% | 36.0% | 36.0% | 16.7% | 36.0% | | 24.0% | 37.3% | | 10.0% | 14.7% | |
| Maximum Green (s) | 19.0 | 48.0 | 48.0 | 19.0 | 48.0 | | 30.0 | 50.0 | | 9.0 | 16.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | | Yes | Yes | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | | | 5.0 | | | 5.0 | |
| Flash Dont Walk (s) | | 10.0 | 10.0 | | 10.0 | | | 10.0 | | | 10.0 | |
| Pedestrian Calls (#/hr) | | 0 | 0 | | 0 | | | 0 | | | 0 | |
| Act Effect Green (s) | 19.0 | 48.0 | 48.0 | 19.0 | 48.0 | | 30.0 | 50.0 | | 9.0 | 29.0 | |
| Actuated g/C Ratio | 0.13 | 0.32 | 0.32 | 0.13 | 0.32 | | 0.20 | 0.33 | | 0.06 | 0.19 | |
| v/c Ratio | 0.60 | 0.70 | 0.86 | 1.30 | 0.47 | | 0.99 | 0.65 | | 0.18 | 0.57 | |

Alternative E: Direct Connector Kingwood to US 59
 8: Lake Houston Pkwy/Lake Houston Pwky & Northpark Dr.

PM Peak Hour

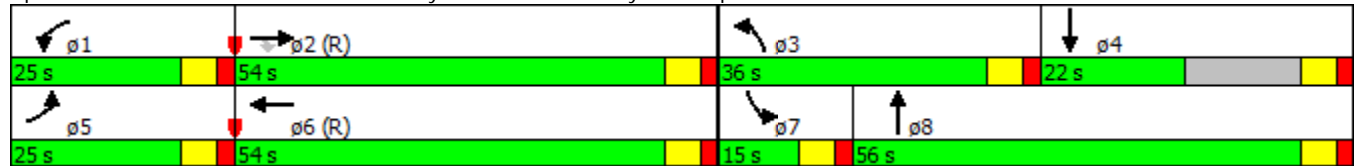


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|------|------|------|-------|-------|-----|------|------|-----|------|------|-----|
| Control Delay | 58.5 | 28.8 | 30.8 | 214.1 | 41.7 | | 92.1 | 34.6 | | 69.2 | 51.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 58.5 | 28.8 | 30.8 | 214.1 | 41.7 | | 92.1 | 34.6 | | 69.2 | 51.4 | |
| LOS | E | C | C | F | D | | F | C | | E | D | |
| Approach Delay | | 32.2 | | | 103.4 | | | 61.2 | | | 52.9 | |
| Approach LOS | | C | | | F | | | E | | | D | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 130 (87%), Referenced to phase 2:EBT and 6:WBT, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 1.30 |
| Intersection Signal Delay: | 57.6 |
| Intersection LOS: | E |
| Intersection Capacity Utilization | 82.7% |
| ICU Level of Service | E |
| Analysis Period (min) | 15 |

Splits and Phases: 8: Lake Houston Pkwy/Lake Houston Pwky & Northpark Dr.



Alternative E: Direct Connector Kingwood to US 59
11: Woodland Hills & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 59 | 1364 | 179 | 171 | 936 | 108 | 277 | 149 | 276 | 138 | 159 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 150 | | 0 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 2 | | 0 | 1 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.981 | | | 0.979 | | | 0.905 | | | 0.966 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3472 | 0 | 1770 | 3465 | 0 | 3433 | 3203 | 0 | 1770 | 3419 | 0 |
| Flt Permitted | 0.057 | | | 0.062 | | | 0.467 | | | 0.276 | | |
| Satd. Flow (perm) | 106 | 3472 | 0 | 115 | 3465 | 0 | 1688 | 3203 | 0 | 514 | 3419 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 12 | | | 12 | | | 203 | | | 21 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 30 | |
| Link Distance (ft) | | 981 | | | 4845 | | | 3684 | | | 2505 | |
| Travel Time (s) | | 14.9 | | | 73.4 | | | 83.7 | | | 56.9 | |
| Peak Hour Factor | 0.78 | 0.99 | 0.88 | 0.89 | 0.94 | 0.68 | 0.92 | 0.87 | 0.92 | 0.91 | 0.72 | 0.69 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 85 | 1557 | 230 | 217 | 1125 | 179 | 340 | 194 | 339 | 171 | 250 | 72 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 85 | 1787 | 0 | 217 | 1304 | 0 | 340 | 533 | 0 | 171 | 322 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 40 | | | 100 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | 2 | | | 6 | | | 8 | | | 4 | | |

Alternative E: Direct Connector Kingwood to US 59
 11: Woodland Hills & Northpark Dr.

PM Peak Hour

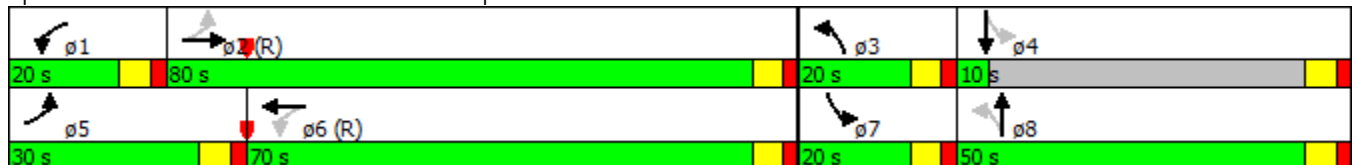


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-----|-------|------|-----|
| Detector Phase | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 8.0 | 10.0 | | 10.0 | 10.0 | | 8.0 | 8.0 | | 10.0 | 4.0 | |
| Minimum Split (s) | 14.0 | 26.0 | | 16.0 | 26.0 | | 14.0 | 14.0 | | 16.0 | 20.0 | |
| Total Split (s) | 30.0 | 80.0 | | 20.0 | 70.0 | | 20.0 | 50.0 | | 20.0 | 10.0 | |
| Total Split (%) | 17.6% | 47.1% | | 11.8% | 41.2% | | 11.8% | 29.4% | | 11.8% | 5.9% | |
| Maximum Green (s) | 24.0 | 74.0 | | 14.0 | 64.0 | | 14.0 | 44.0 | | 14.0 | 4.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | Max | C-Max | | Max | C-Max | | Max | Max | | Max | Max | |
| Walk Time (s) | 0.0 | 4.0 | | 0.0 | 4.0 | | 0.0 | 0.0 | | 0.0 | 4.0 | |
| Flash Dont Walk (s) | 0.0 | 16.0 | | 0.0 | 16.0 | | 0.0 | 0.0 | | 0.0 | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effect Green (s) | 94.0 | 74.0 | | 78.0 | 64.0 | | 58.0 | 44.0 | | 58.0 | 44.0 | |
| Actuated g/C Ratio | 0.55 | 0.44 | | 0.46 | 0.38 | | 0.34 | 0.26 | | 0.34 | 0.26 | |
| v/c Ratio | 0.29 | 1.18 | | 1.15 | 0.99 | | 0.47 | 0.54 | | 0.62 | 0.36 | |
| Control Delay | 24.4 | 129.0 | | 155.7 | 75.1 | | 39.4 | 35.0 | | 47.6 | 49.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 24.4 | 129.0 | | 155.7 | 75.1 | | 39.4 | 35.0 | | 47.6 | 49.3 | |
| LOS | C | F | | F | E | | D | D | | D | D | |
| Approach Delay | | 124.2 | | | 86.6 | | | 36.7 | | | 48.7 | |
| Approach LOS | | F | | | F | | | D | | | D | |

Intersection Summary

Area Type: Other
 Cycle Length: 170
 Actuated Cycle Length: 170
 Offset: 120 (71%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.18
 Intersection Signal Delay: 88.3
 Intersection LOS: F
 Intersection Capacity Utilization 103.1%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 11: Woodland Hills & Northpark Dr.



Alternative E: Direct Connector Kingwood to US 59
 14: US 59 SBFR & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|-------|-------|---------|--------|-------|------|------|-------|-------|-------|-------|
| Lane Configurations | | ↑↑↑↑ | | ↔↔ | ↑↑ | | | | | ↔ | ↑↑↑↑ | ↔ |
| Volume (vph) | 0 | 304 | 131 | 776 | 875 | 0 | 0 | 0 | 0 | 316 | 172 | 61 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 150 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 2 | 2 | | 0 | 0 | | 0 | 1 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.86 | 0.86 | 0.97 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.86 | 0.81 | 0.86 |
| Frt | | 0.956 | | | | | | | | | 0.997 | 0.850 |
| Flt Protected | | | | 0.950 | | | | | | 0.950 | 0.978 | |
| Satd. Flow (prot) | 0 | 6126 | 0 | 3433 | 3539 | 0 | 0 | 0 | 0 | 1522 | 4414 | 1362 |
| Flt Permitted | | | | 0.950 | | | | | | 0.950 | 0.978 | |
| Satd. Flow (perm) | 0 | 6126 | 0 | 3433 | 3539 | 0 | 0 | 0 | 0 | 1522 | 4414 | 1362 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 56 | | | | | | | | | 1 | 223 |
| Link Speed (mph) | | 40 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 3872 | | | 281 | | | 368 | | | 304 | |
| Travel Time (s) | | 66.0 | | | 6.4 | | | 8.4 | | | 6.9 | |
| Peak Hour Factor | 0.92 | 0.82 | 0.86 | 0.90 | 0.94 | 0.92 | 0.92 | 0.92 | 0.92 | 0.88 | 0.78 | 0.76 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 419 | 172 | 974 | 1052 | 0 | 0 | 0 | 0 | 406 | 249 | 91 |
| Shared Lane Traffic (%) | | | | | | | | | | 50% | | 10% |
| Lane Group Flow (vph) | 0 | 591 | 0 | 974 | 1052 | 0 | 0 | 0 | 0 | 203 | 461 | 82 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 50 | | | 24 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | | 2 | | 1 | 2 | | | | | 1 | 2 | 1 |
| Detector Template | | Thru | | Left | Thru | | | | | Left | Thru | Right |
| Leading Detector (ft) | | 100 | | 20 | 100 | | | | | 20 | 100 | 20 |
| Trailing Detector (ft) | | 0 | | 0 | 0 | | | | | 0 | 0 | 0 |
| Detector 1 Position(ft) | | 0 | | 0 | 0 | | | | | 0 | 0 | 0 |
| Detector 1 Size(ft) | | 6 | | 20 | 6 | | | | | 20 | 6 | 20 |
| Detector 1 Type | | Cl+Ex | | Cl+Ex | Cl+Ex | | | | | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | | 0.0 | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | | | | 0.0 | |
| Turn Type | | NA | | Prot | NA | | | | | Perm | NA | Perm |
| Protected Phases | | 2 | | 1 11 21 | 1 2 11 | | | | | | 3 4 | |
| Permitted Phases | | | | | | | | | | 3 4 | | 3 4 |

Alternative E: Direct Connector Kingwood to US 59
 14: US 59 SBFR & Northpark Dr.

PM Peak Hour

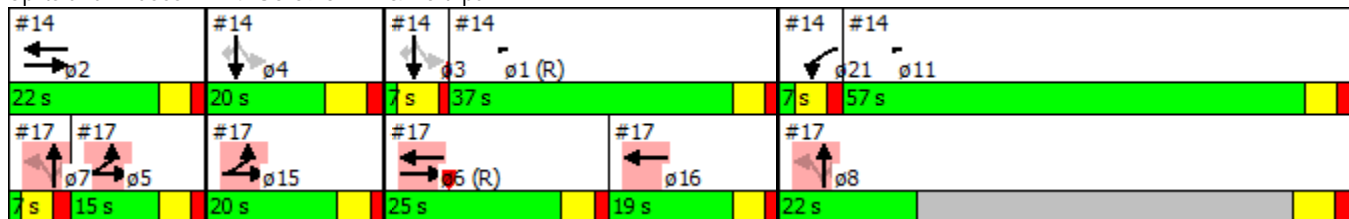


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-------|-----|---------|--------|-----|-----|-----|-----|-------|--------|------|
| Detector Phase | | 2 | | 1 11 21 | 1 2 11 | | | | | 3 4 | 3 4 | 3 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | 7.0 | | | | | | | | | | |
| Minimum Split (s) | | 14.0 | | | | | | | | | | |
| Total Split (s) | | 22.0 | | | | | | | | | | |
| Total Split (%) | | 14.7% | | | | | | | | | | |
| Maximum Green (s) | | 16.7 | | | | | | | | | | |
| Yellow Time (s) | | 3.6 | | | | | | | | | | |
| All-Red Time (s) | | 1.7 | | | | | | | | | | |
| Lost Time Adjust (s) | | 0.0 | | | | | | | | | | |
| Total Lost Time (s) | | 5.3 | | | | | | | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | | 3.0 | | | | | | | | | | |
| Recall Mode | | None | | | | | | | | | | |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effect Green (s) | | 16.7 | | 95.7 | 105.4 | | | | | 21.3 | 21.3 | 21.3 |
| Actuated g/C Ratio | | 0.11 | | 0.64 | 0.70 | | | | | 0.14 | 0.14 | 0.14 |
| v/c Ratio | | 0.81 | | 0.44 | 0.42 | | | | | 0.94 | 0.89dl | 0.21 |
| Control Delay | | 68.3 | | 2.1 | 1.8 | | | | | 110.2 | 69.3 | 1.3 |
| Queue Delay | | 0.0 | | 1.4 | 0.6 | | | | | 0.0 | 0.0 | 0.0 |
| Total Delay | | 68.3 | | 3.5 | 2.4 | | | | | 110.2 | 69.3 | 1.3 |
| LOS | | E | | A | A | | | | | F | E | A |
| Approach Delay | | 68.3 | | | 2.9 | | | | | | 73.0 | |
| Approach LOS | | E | | | A | | | | | | E | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 96 (64%), Referenced to phase 1:WBTL and 6:, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 29.9
 Intersection LOS: C
 Intersection Capacity Utilization 91.0%
 ICU Level of Service E
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 14: US 59 SBFR & Northpark Dr.



Alternative E: Direct Connector Kingwood to US 59
 14: US 59 SBFR & Northpark Dr.

PM Peak Hour

| Lane Group | ø1 | ø3 | ø4 | ø5 | ø6 | ø7 | ø8 | ø11 | ø15 | ø16 | ø21 |
|-------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
| Detector Phase | | | | | | | | | | | |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 1.0 | 5.0 | 2.7 | 5.0 | 1.0 | 1.0 | 3.0 | 3.0 | 4.0 | 1.0 |
| Minimum Split (s) | 21.3 | 7.0 | 11.7 | 8.0 | 26.3 | 7.0 | 21.7 | 8.3 | 8.3 | 21.3 | 7.0 |
| Total Split (s) | 37.0 | 7.0 | 20.0 | 15.0 | 25.0 | 7.0 | 22.0 | 57.0 | 20.0 | 19.0 | 7.0 |
| Total Split (%) | 25% | 5% | 13% | 10% | 17% | 5% | 15% | 38% | 13% | 13% | 5% |
| Maximum Green (s) | 31.7 | 1.3 | 13.3 | 9.7 | 19.7 | 1.3 | 15.3 | 51.7 | 14.7 | 13.7 | 1.7 |
| Yellow Time (s) | 3.6 | 4.7 | 4.7 | 3.6 | 3.6 | 3.7 | 4.7 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.7 | 1.0 | 2.0 | 1.7 | 1.7 | 2.0 | 2.0 | 1.7 | 1.7 | 1.7 | 1.7 |
| Lost Time Adjust (s) | | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | Lag | | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | C-Max | None | None | None | C-Max | None | None | None | None | None | None |
| Walk Time (s) | | | | | 5.0 | | 7.0 | | | | |
| Flash Dont Walk (s) | | | | | 16.0 | | 8.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | 0 | | 0 | | | | |
| Act Effct Green (s) | | | | | | | | | | | |
| Actuated g/C Ratio | | | | | | | | | | | |
| v/c Ratio | | | | | | | | | | | |
| Control Delay | | | | | | | | | | | |
| Queue Delay | | | | | | | | | | | |
| Total Delay | | | | | | | | | | | |
| LOS | | | | | | | | | | | |
| Approach Delay | | | | | | | | | | | |
| Approach LOS | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 17: US 59 NBFR & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|--------|-------|------|-------|-------|-------|-------|-------|------|------|-------|
| Lane Configurations | ↔↔ | ↑↑ | | | ↑↑↑ | | ↔↔ | ↑↑ | ↔↔ | | | |
| Volume (vph) | 141 | 495 | 0 | 0 | 1061 | 304 | 553 | 541 | 1115 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 0 | | 150 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 2 | | 0 | 0 | | 2 | 2 | | 2 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 1.00 | 0.86 | 0.86 | 0.97 | 0.95 | 0.88 | 1.00 | 1.00 | 1.00 |
| Fr _t | | | | | 0.967 | | | | 0.850 | | | |
| Fl _t Protected | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (prot) | 3433 | 3539 | 0 | 0 | 6196 | 0 | 3433 | 3539 | 2787 | 0 | 0 | 0 |
| Fl _t Permitted | 0.950 | | | | | | 0.950 | | | | | |
| Satd. Flow (perm) | 3433 | 3539 | 0 | 0 | 6196 | 0 | 3433 | 3539 | 2787 | 0 | 0 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 45 | | | | 681 | | | |
| Link Speed (mph) | | 30 | | | 45 | | | 30 | | | 30 | |
| Link Distance (ft) | | 281 | | | 1797 | | | 365 | | | 309 | |
| Travel Time (s) | | 6.4 | | | 27.2 | | | 8.3 | | | 7.0 | |
| Peak Hour Factor | 0.75 | 0.94 | 0.92 | 0.92 | 0.89 | 0.91 | 0.93 | 0.96 | 0.90 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 212 | 595 | 0 | 0 | 1347 | 377 | 672 | 637 | 1400 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 212 | 595 | 0 | 0 | 1724 | 0 | 672 | 637 | 1400 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | | 2 | | 1 | 2 | 1 | | | |
| Detector Template | Left | Thru | | | Thru | | Left | Thru | Right | | | |
| Leading Detector (ft) | 20 | 100 | | | 100 | | 20 | 100 | 20 | | | |
| Trailing Detector (ft) | 0 | 0 | | | 0 | | 0 | 0 | 0 | | | |
| Detector 1 Position(ft) | 0 | 0 | | | 0 | | 0 | 0 | 0 | | | |
| Detector 1 Size(ft) | 20 | 6 | | | 6 | | 20 | 6 | 20 | | | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Turn Type | Prot | NA | | | NA | | Perm | NA | Perm | | | |
| Protected Phases | 5 15 | 5 6 15 | | | 6 16 | | | 7 8 | | | | |
| Permitted Phases | | | | | | | 7 8 | | 7 8 | | | |

Alternative E: Direct Connector Kingwood to US 59
 17: US 59 NBFR & Northpark Dr.

PM Peak Hour

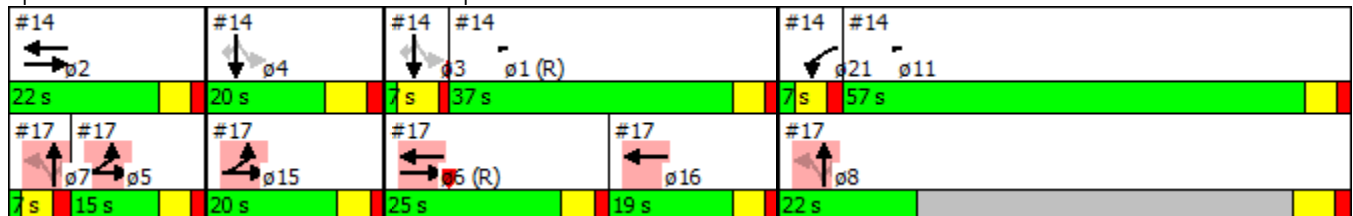


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|--------|-----|-----|------|-----|------|------|------|-----|-----|-----|
| Detector Phase | 5 15 | 5 6 15 | | | 6 16 | | 7 8 | 7 8 | 7 8 | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | | | | | | | | | |
| Minimum Split (s) | | | | | | | | | | | | |
| Total Split (s) | | | | | | | | | | | | |
| Total Split (%) | | | | | | | | | | | | |
| Maximum Green (s) | | | | | | | | | | | | |
| Yellow Time (s) | | | | | | | | | | | | |
| All-Red Time (s) | | | | | | | | | | | | |
| Lost Time Adjust (s) | | | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Recall Mode | | | | | | | | | | | | |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effct Green (s) | 29.7 | 54.7 | | | 38.7 | | 65.3 | 65.3 | 65.3 | | | |
| Actuated g/C Ratio | 0.20 | 0.36 | | | 0.26 | | 0.44 | 0.44 | 0.44 | | | |
| v/c Ratio | 0.31 | 0.46 | | | 1.06 | | 0.45 | 0.41 | 0.88 | | | |
| Control Delay | 32.8 | 2.4 | | | 77.7 | | 31.0 | 30.2 | 26.4 | | | |
| Queue Delay | 0.0 | 2.6 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Total Delay | 32.8 | 5.0 | | | 77.7 | | 31.0 | 30.2 | 26.4 | | | |
| LOS | C | A | | | E | | C | C | C | | | |
| Approach Delay | | 12.3 | | | 77.7 | | | 28.4 | | | | |
| Approach LOS | | B | | | E | | | C | | | | |

Intersection Summary

| | |
|-----------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 96 (64%), Referenced to phase 1:WBTL and 6:, Start of Green |
| Natural Cycle: | 100 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.06 |
| Intersection Signal Delay: | 42.2 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 91.0% |
| ICU Level of Service | E |
| Analysis Period (min) | 15 |

Splits and Phases: 17: US 59 NBFR & Northpark Dr.




















Alternative E: Direct Connector Kingwood to US 59
 17: US 59 NBFR & Northpark Dr.

PM Peak Hour

| Lane Group | ø1 | ø2 | ø3 | ø4 | ø5 | ø6 | ø7 | ø8 | ø11 | ø15 | ø16 | ø21 | | | | |
|-------------------------|-------|------|------|------|------|-------|------|------|------|------|------|------|-----|--|------|--|
| Detector Phase | | | | | | | | | | | | | | | | |
| Switch Phase | | | | | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 7.0 | 1.0 | 5.0 | 2.7 | 5.0 | 1.0 | 1.0 | 3.0 | 3.0 | 4.0 | 1.0 | | | | |
| Minimum Split (s) | 21.3 | 14.0 | 7.0 | 11.7 | 8.0 | 26.3 | 7.0 | 21.7 | 8.3 | 8.3 | 21.3 | 7.0 | | | | |
| Total Split (s) | 37.0 | 22.0 | 7.0 | 20.0 | 15.0 | 25.0 | 7.0 | 22.0 | 57.0 | 20.0 | 19.0 | 7.0 | | | | |
| Total Split (%) | 25% | 15% | 5% | 13% | 10% | 17% | 5% | 15% | 38% | 13% | 13% | 5% | | | | |
| Maximum Green (s) | 31.7 | 16.7 | 1.3 | 13.3 | 9.7 | 19.7 | 1.3 | 15.3 | 51.7 | 14.7 | 13.7 | 1.7 | | | | |
| Yellow Time (s) | 3.6 | 3.6 | 4.7 | 4.7 | 3.6 | 3.6 | 3.7 | 4.7 | 3.6 | 3.6 | 3.6 | 3.6 | | | | |
| All-Red Time (s) | 1.7 | 1.7 | 1.0 | 2.0 | 1.7 | 1.7 | 2.0 | 2.0 | 1.7 | 1.7 | 1.7 | 1.7 | | | | |
| Lost Time Adjust (s) | | | | | | | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | | | | | | | |
| Lead/Lag | Lag | | Lead | | Lag | | Lead | | Lead | | Lag | | Lag | | Lead | |
| Lead-Lag Optimize? | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | | |
| Recall Mode | C-Max | None | None | None | None | C-Max | None | None | None | None | None | None | | | | |
| Walk Time (s) | | | | | | | 5.0 | | | | | | 7.0 | | | |
| Flash Dont Walk (s) | | | | | | | 16.0 | | | | | | 8.0 | | | |
| Pedestrian Calls (#/hr) | | | | | | | 0 | | | | | | 0 | | | |
| Act Effect Green (s) | | | | | | | | | | | | | | | | |
| Actuated g/C Ratio | | | | | | | | | | | | | | | | |
| v/c Ratio | | | | | | | | | | | | | | | | |
| Control Delay | | | | | | | | | | | | | | | | |
| Queue Delay | | | | | | | | | | | | | | | | |
| Total Delay | | | | | | | | | | | | | | | | |
| LOS | | | | | | | | | | | | | | | | |
| Approach Delay | | | | | | | | | | | | | | | | |
| Approach LOS | | | | | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 19: US 59 NBFR & Hamblen

PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|--|--|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations | |  | | | |  | |   |  | | | |
| Volume (vph) | 4 | 96 | 0 | 0 | 0 | 123 | 0 | 808 | 878 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | 0.865 | | | 0.850 | | | |
| Flt Protected | | 0.998 | | | | | | | | | | |
| Satd. Flow (prot) | 0 | 1859 | 0 | 0 | 0 | 1611 | 0 | 3539 | 1583 | 0 | 0 | 0 |
| Flt Permitted | | 0.998 | | | | | | | | | | |
| Satd. Flow (perm) | 0 | 1859 | 0 | 0 | 0 | 1611 | 0 | 3539 | 1583 | 0 | 0 | 0 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | | 30 |
| Link Distance (ft) | | 168 | | | 123 | | | 612 | | | | 7207 |
| Travel Time (s) | | 3.8 | | | 2.8 | | | 13.9 | | | | 163.8 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 5 | 118 | 0 | 0 | 0 | 151 | 0 | 992 | 1078 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 123 | 0 | 0 | 0 | 151 | 0 | 992 | 1078 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Free | | | | Stop |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 74.1% |
| Analysis Period (min) | 15 |
| | ICU Level of Service D |

Alternative E: Direct Connector Kingwood to US 59
20: Loop 494 & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 20 | 1433 | 61 | 192 | 989 | 155 | 89 | 158 | 420 | 205 | 245 | 199 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 150 | | 0 | 500 | | 500 | 0 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | 25 | | | 25 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.994 | | | 0.980 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3518 | 0 | 1770 | 3468 | 0 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3518 | 0 | 1770 | 3468 | 0 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | 14 | | | | 174 | | | 241 |
| Link Speed (mph) | | 45 | | | 45 | | | 45 | | | | 45 |
| Link Distance (ft) | | 1797 | | | 1638 | | | 3315 | | | | 2861 |
| Travel Time (s) | | 27.2 | | | 24.8 | | | 50.2 | | | | 43.3 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 25 | 1760 | 75 | 236 | 1215 | 190 | 109 | 194 | 516 | 252 | 301 | 244 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 25 | 1835 | 0 | 236 | 1405 | 0 | 109 | 194 | 516 | 252 | 301 | 244 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | | 12 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | | | | | | | 8 | | | 4 |

Alternative E: Direct Connector Kingwood to US 59
 20: Loop 494 & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| Detector Phase | 5 | 2 | | 1 | 6 | | 3 | 8 | 8 | 7 | 4 | 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 12.0 | | 7.0 | 12.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 11.0 | 18.0 | | 13.0 | 18.0 | | 11.3 | 11.3 | 11.3 | 11.3 | 11.3 | 11.3 |
| Total Split (s) | 20.0 | 70.0 | | 20.0 | 70.0 | | 25.0 | 35.0 | 35.0 | 25.0 | 35.0 | 35.0 |
| Total Split (%) | 13.3% | 46.7% | | 13.3% | 46.7% | | 16.7% | 23.3% | 23.3% | 16.7% | 23.3% | 23.3% |
| Maximum Green (s) | 14.0 | 64.0 | | 14.0 | 64.0 | | 18.7 | 28.7 | 28.7 | 18.7 | 28.7 | 28.7 |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 | 6.3 |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | | None | C-Max | | None | None | None | None | None | None |
| Walk Time (s) | | 0.0 | | | 0.0 | | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Flash Dont Walk (s) | | 0.0 | | | 0.0 | | | 0.0 | 0.0 | | 0.0 | 0.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | 0 | | 0 | 0 |
| Act Effect Green (s) | 7.6 | 64.0 | | 14.0 | 75.2 | | 14.3 | 28.7 | 28.7 | 18.7 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.05 | 0.43 | | 0.09 | 0.50 | | 0.10 | 0.19 | 0.19 | 0.12 | 0.22 | 0.22 |
| v/c Ratio | 0.28 | 1.22 | | 1.43 | 0.81 | | 0.65 | 0.54 | 1.16 | 1.15 | 0.73 | 0.45 |
| Control Delay | 75.2 | 133.9 | | 270.5 | 36.6 | | 98.8 | 52.2 | 123.0 | 161.5 | 66.4 | 9.0 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 75.2 | 133.9 | | 270.5 | 36.6 | | 98.8 | 52.2 | 123.0 | 161.5 | 66.4 | 9.0 |
| LOS | E | F | | F | D | | F | D | F | F | E | A |
| Approach Delay | | 133.1 | | | 70.3 | | | 103.0 | | | 78.9 | |
| Approach LOS | | F | | | E | | | F | | | E | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 60 (40%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.43
 Intersection Signal Delay: 99.7
 Intersection LOS: F
 Intersection Capacity Utilization 104.7%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 20: Loop 494 & Northpark Dr.



Alternative E: Direct Connector Kingwood to US 59
23: Brookdale & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 141 | 1332 | 54 | 9 | 1047 | 31 | 54 | 13 | 21 | 36 | 14 | 97 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 150 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.993 | | | 0.994 | | | 0.968 | | | 0.906 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.971 | | | 0.989 | |
| Satd. Flow (prot) | 1770 | 3514 | 0 | 1770 | 3518 | 0 | 0 | 3327 | 0 | 0 | 3171 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.688 | | | 0.855 | |
| Satd. Flow (perm) | 1770 | 3514 | 0 | 1770 | 3518 | 0 | 0 | 2357 | 0 | 0 | 2742 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 4 | | | 3 | | | 24 | | | 159 | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 30 | |
| Link Distance (ft) | | 4845 | | | 2785 | | | 1365 | | | 843 | |
| Travel Time (s) | | 73.4 | | | 42.2 | | | 31.0 | | | 19.2 | |
| Peak Hour Factor | 0.77 | 0.97 | 0.84 | 0.75 | 0.94 | 0.70 | 0.79 | 0.65 | 0.88 | 0.69 | 0.44 | 0.69 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 207 | 1552 | 73 | 14 | 1259 | 50 | 77 | 23 | 27 | 59 | 36 | 159 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 207 | 1625 | 0 | 14 | 1309 | 0 | 0 | 127 | 0 | 0 | 254 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 100 | | | 100 | | | 45 | | | 45 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | | | | | | | | | | |
| Minimum Split (s) | 12.0 | 19.0 | | 12.0 | 19.0 | | 12.0 | 21.0 | | 12.0 | 21.0 | |
| Total Split (s) | 30.0 | 70.0 | | 20.0 | 60.0 | | 30.0 | 30.0 | | 30.0 | 30.0 | |
| Total Split (%) | 20.0% | 46.7% | | 13.3% | 40.0% | | 20.0% | 20.0% | | 20.0% | 20.0% | |
| Maximum Green (s) | 24.0 | 64.0 | | 14.0 | 54.0 | | 24.0 | 24.0 | | 24.0 | 24.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | | 6.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | | Yes | Yes | | Yes | Yes | |
| Walk Time (s) | 0.0 | 4.0 | | 0.0 | 4.0 | | 0.0 | 4.0 | | 0.0 | 4.0 | |
| Flash Dont Walk (s) | 0.0 | 9.0 | | 0.0 | 9.0 | | 0.0 | 11.0 | | 0.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effect Green (s) | 24.0 | 64.0 | | 14.0 | 54.0 | | 24.0 | 48.0 | | 24.0 | 48.0 | |
| Actuated g/C Ratio | 0.16 | 0.43 | | 0.09 | 0.36 | | 0.32 | 0.32 | | 0.32 | 0.32 | |
| v/c Ratio | 0.73 | 1.08 | | 0.08 | 1.03 | | 0.20 | 0.33 | | 0.33 | 0.33 | |

Alternative E: Direct Connector Kingwood to US 59
 23: Brookdale & Northpark Dr.

PM Peak Hour

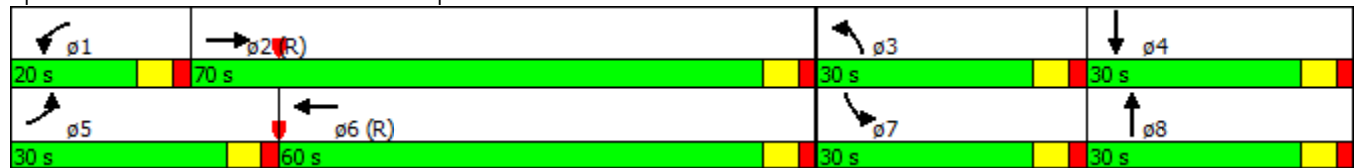


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|------|------|-----|------|------|-----|-----|------|-----|-----|------|-----|
| Control Delay | 75.9 | 89.7 | | 68.6 | 53.8 | | | 26.7 | | | 13.4 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 75.9 | 89.7 | | 68.6 | 53.8 | | | 26.7 | | | 13.4 | |
| LOS | E | F | | E | D | | | C | | | B | |
| Approach Delay | | 88.2 | | | 53.9 | | | 26.7 | | | 13.4 | |
| Approach LOS | | F | | | D | | | C | | | B | |

Intersection Summary

| | |
|-----------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 55 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 1.08 |
| Intersection Signal Delay: | 67.8 |
| Intersection LOS: | E |
| Intersection Capacity Utilization | 78.7% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

Splits and Phases: 23: Brookdale & Northpark Dr.



Alternative E: Direct Connector Kingwood to US 59
 26: Northpark Dr. & Mills Branch

PM Peak Hour



| Lane Group | WBL | WBR | SEL | SER | NEL | NER |
|----------------------------|--------|-------|------|-------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1863 | 0 | 0 | 0 | 0 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1863 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Yes | Yes | | Yes | | Yes |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (mph) | 30 | | 30 | | 40 | |
| Link Distance (ft) | 8307 | | 3268 | | 1785 | |
| Travel Time (s) | 188.8 | | 74.3 | | 30.4 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Right |
| Median Width(ft) | 12 | | 0 | | 12 | |
| Link Offset(ft) | 0 | | 0 | | 0 | |
| Crosswalk Width(ft) | 16 | | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | 9 | 15 | 9 |
| Turn Type | | | | | | |
| Protected Phases | 8 | | | | | |
| Permitted Phases | | | | | | |
| Minimum Split (s) | 20.0 | | | | | |
| Total Split (s) | 20.0 | | | | | |
| Total Split (%) | 100.0% | | | | | |
| Maximum Green (s) | 16.0 | | | | | |
| Yellow Time (s) | 3.5 | | | | | |
| All-Red Time (s) | 0.5 | | | | | |
| Lost Time Adjust (s) | 0.0 | | | | | |
| Total Lost Time (s) | 4.0 | | | | | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 5.0 | | | | | |
| Flash Dont Walk (s) | 11.0 | | | | | |
| Pedestrian Calls (#/hr) | 0 | | | | | |
| Act Effect Green (s) | | | | | | |
| Actuated g/C Ratio | | | | | | |
| v/c Ratio | | | | | | |
| Control Delay | | | | | | |
| Queue Delay | | | | | | |
| Total Delay | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 26: Northpark Dr. & Mills Branch

PM Peak Hour



| Lane Group | WBL | WBR | SEL | SER | NEL | NER |
|------------|-----|-----|-----|-----|-----|-----|
|------------|-----|-----|-----|-----|-----|-----|

| | | | | | | |
|-----|--|--|--|--|--|--|
| LOS | | | | | | |
|-----|--|--|--|--|--|--|

| | | | | | | |
|----------------|--|--|--|--|--|--|
| Approach Delay | | | | | | |
|----------------|--|--|--|--|--|--|

| | | | | | | |
|--------------|--|--|--|--|--|--|
| Approach LOS | | | | | | |
|--------------|--|--|--|--|--|--|

Intersection Summary

| | |
|------------|-------|
| Area Type: | Other |
|------------|-------|

| | |
|---------------|----|
| Cycle Length: | 20 |
|---------------|----|

| | |
|------------------------|----|
| Actuated Cycle Length: | 20 |
|------------------------|----|

| | |
|---------|---|
| Offset: | 0 (0%), Referenced to phase 2: and 6:, Start of Green |
|---------|---|

| | |
|----------------|----|
| Natural Cycle: | 40 |
|----------------|----|

| | |
|---------------|----------|
| Control Type: | Pretimed |
|---------------|----------|

| | |
|--------------------|------|
| Maximum v/c Ratio: | 0.00 |
|--------------------|------|

| | | | |
|----------------------------|-----|-------------------|---|
| Intersection Signal Delay: | 0.0 | Intersection LOS: | A |
|----------------------------|-----|-------------------|---|

| | | | |
|------------------------------------|------|-----------------------|---|
| Intersection Capacity Utilization: | 0.0% | ICU Level of Service: | A |
|------------------------------------|------|-----------------------|---|

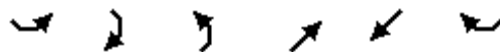
| | |
|------------------------|----|
| Analysis Period (min): | 15 |
|------------------------|----|

Splits and Phases: 26: Northpark Dr. & Mills Branch



Alternative E: Direct Connector Kingwood to US 59
 28: Kingwood Dr./Kingwood Dr. & Mills Branch

PM Peak Hour



| Lane Group | SEL | SER | NEL | NET | SWT | SWR |
|----------------------------|------|-------|------|--------|------|-------|
| Lane Configurations | | | | ↑↑ | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3539 | 0 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3539 | 0 | 0 |
| Right Turn on Red | Yes | Yes | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | |
| Link Speed (mph) | 30 | | | 40 | 30 | |
| Link Distance (ft) | 71 | | | 1387 | 344 | |
| Travel Time (s) | 1.6 | | | 23.6 | 7.8 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 0 | | | 0 | 0 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 |
| Turn Type | | | | | | |
| Protected Phases | | | | 2 | | |
| Permitted Phases | | | | | | |
| Minimum Split (s) | | | | 20.0 | | |
| Total Split (s) | | | | 20.0 | | |
| Total Split (%) | | | | 100.0% | | |
| Maximum Green (s) | | | | 16.0 | | |
| Yellow Time (s) | | | | 3.5 | | |
| All-Red Time (s) | | | | 0.5 | | |
| Lost Time Adjust (s) | | | | 0.0 | | |
| Total Lost Time (s) | | | | 4.0 | | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | | | | 5.0 | | |
| Flash Dont Walk (s) | | | | 11.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effect Green (s) | | | | | | |
| Actuated g/C Ratio | | | | | | |
| v/c Ratio | | | | | | |
| Control Delay | | | | | | |
| Queue Delay | | | | | | |
| Total Delay | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
28: Kingwood Dr./Kingwood Dr. & Mills Branch

PM Peak Hour



| Lane Group | SEL | SER | NEL | NET | SWT | SWR |
|------------|-----|-----|-----|-----|-----|-----|
|------------|-----|-----|-----|-----|-----|-----|

LOS

Approach Delay

Approach LOS

Intersection Summary

Area Type: Other

Cycle Length: 20

Actuated Cycle Length: 20

Offset: 0 (0%), Referenced to phase 2:NET and 6:, Start of Green

Natural Cycle: 40

Control Type: Pretimed

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0 Intersection LOS: A

Intersection Capacity Utilization 0.0% ICU Level of Service A

Analysis Period (min) 15

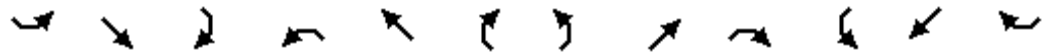
Splits and Phases: 28: Kingwood Dr./Kingwood Dr. & Mills Branch



| Lane Group | ø2 | ø15 |
|----------------------------|----|-----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 29: Northpark Dr. & Rock Springs

PM Peak Hour

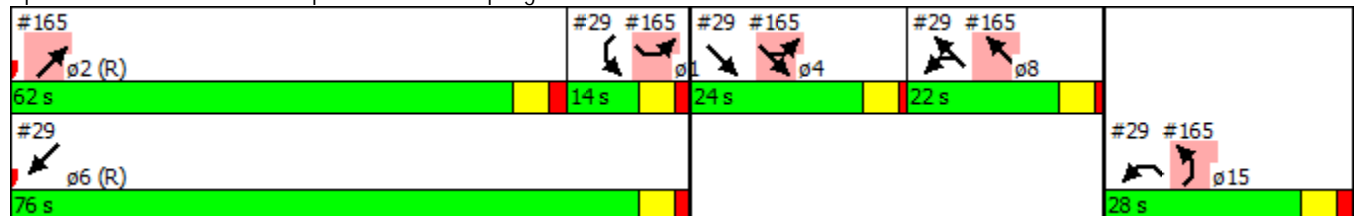


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------------|-----|-------|-----|------|-------|-----|-----|-----|-----|------|-------|-----|
| Detector Phase | | 4 | | 15 | 8 | | | | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | 5.0 | | | 5.0 | | | | | 5.0 | 4.0 | |
| Minimum Split (s) | | 22.0 | | | 20.0 | | | | | 11.0 | 18.0 | |
| Total Split (s) | | 24.0 | | | 22.0 | | | | | 14.0 | 76.0 | |
| Total Split (%) | | 16.0% | | | 14.7% | | | | | 9.3% | 50.7% | |
| Maximum Green (s) | | 19.0 | | | 17.0 | | | | | 8.0 | 70.0 | |
| Yellow Time (s) | | 4.0 | | | 4.0 | | | | | 4.0 | 4.0 | |
| All-Red Time (s) | | 1.0 | | | 1.0 | | | | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | | | 0.0 | 0.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | | | 6.0 | 6.0 | |
| Lead/Lag | | Lead | | | Lag | | | | | Lag | | |
| Lead-Lag Optimize? | | Yes | | | Yes | | | | | Yes | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | | | 3.0 | 3.0 | |
| Recall Mode | | None | | | Max | | | | | None | C-Max | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | | | | 5.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 10.0 | | | | | | 7.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | | | | 0 | |
| Act Effect Green (s) | | 7.6 | | 49.8 | 28.4 | | | | | 7.2 | 75.6 | |
| Actuated g/C Ratio | | 0.05 | | 0.33 | 0.19 | | | | | 0.05 | 0.50 | |
| v/c Ratio | | 0.48 | | 0.12 | 0.19 | | | | | 0.27 | 0.38 | |
| Control Delay | | 32.4 | | 4.5 | 74.8 | | | | | 76.7 | 24.0 | |
| Queue Delay | | 0.0 | | 0.9 | 2.7 | | | | | 0.0 | 0.0 | |
| Total Delay | | 32.4 | | 5.5 | 77.5 | | | | | 76.7 | 24.0 | |
| LOS | | C | | A | E | | | | | E | C | |
| Approach Delay | | 32.4 | | | 51.5 | | | | | | 25.7 | |
| Approach LOS | | C | | | D | | | | | | C | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 45 (30%), Referenced to phase 2:NET and 6:, Start of Green
 Natural Cycle: 95
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 31.6
 Intersection LOS: C
 Intersection Capacity Utilization 45.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 29: Northpark Dr. & Rock Springs



| Lane Group | ø2 | ø15 |
|-------------------------|-------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 4.0 | 5.0 |
| Minimum Split (s) | 18.0 | 11.0 |
| Total Split (s) | 62.0 | 28.0 |
| Total Split (%) | 41% | 19% |
| Maximum Green (s) | 56.0 | 22.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | C-Max | None |
| Walk Time (s) | 5.0 | |
| Flash Dont Walk (s) | 7.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 34: Kingwood Dr. & Woodland Grove

PM Peak Hour



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR | ø1 | ø3 | ø4 | ø6 | ø7 | ø8 |
|-------------------------|-------|-------|------|-----|------|-----|------|------|------|-------|------|------|
| Detector Phase | 5 | 2 | 3 6 | | 4 7 | | | | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 10.0 | | | | | 3.0 | 1.0 | 5.0 | 2.0 | 1.0 | 5.0 |
| Minimum Split (s) | 9.0 | 29.5 | | | | | 10.0 | 14.0 | 10.0 | 21.0 | 8.0 | 21.0 |
| Total Split (s) | 32.0 | 109.0 | | | | | 10.0 | 21.0 | 10.0 | 87.0 | 10.0 | 21.0 |
| Total Split (%) | 21.3% | 72.7% | | | | | 7% | 14% | 7% | 58% | 7% | 14% |
| Maximum Green (s) | 26.0 | 96.0 | | | | | 4.0 | 8.0 | 5.0 | 82.0 | 5.0 | 16.0 |
| Yellow Time (s) | 4.0 | 4.0 | | | | | 4.0 | 3.5 | 3.5 | 4.0 | 3.5 | 3.5 |
| All-Red Time (s) | 2.0 | 9.0 | | | | | 2.0 | 9.5 | 1.5 | 1.0 | 1.5 | 1.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | | | | | | | | | |
| Total Lost Time (s) | 6.0 | 13.0 | | | | | | | | | | |
| Lead/Lag | Lead | Lead | | | | | Lag | | | Lag | | |
| Lead-Lag Optimize? | Yes | Yes | | | | | Yes | | | Yes | | |
| Vehicle Extension (s) | 0.2 | 0.2 | | | | | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Recall Mode | None | C-Max | | | | | None | Max | None | C-Max | None | Max |
| Walk Time (s) | | 5.0 | | | | | | | | 5.0 | | |
| Flash Dont Walk (s) | | 11.0 | | | | | | | | 11.0 | | |
| Pedestrian Calls (#/hr) | | 0 | | | | | | | | 0 | | |
| Act Effect Green (s) | 21.7 | 96.0 | 99.3 | | 5.0 | | | | | | | |
| Actuated g/C Ratio | 0.14 | 0.64 | 0.66 | | 0.03 | | | | | | | |
| v/c Ratio | 0.90 | 1.19 | 0.72 | | 0.84 | | | | | | | |
| Control Delay | 98.3 | 119.4 | 3.5 | | 59.6 | | | | | | | |
| Queue Delay | 0.0 | 0.1 | 0.2 | | 0.6 | | | | | | | |
| Total Delay | 98.3 | 119.5 | 3.7 | | 60.2 | | | | | | | |
| LOS | F | F | A | | E | | | | | | | |
| Approach Delay | | 117.8 | 3.7 | | 60.2 | | | | | | | |
| Approach LOS | | F | A | | E | | | | | | | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.62
 Intersection Signal Delay: 75.8
 Intersection LOS: E
 Intersection Capacity Utilization 88.8%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 34: Kingwood Dr. & Woodland Grove



Alternative E: Direct Connector Kingwood to US 59
35: Russel Palmer & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|-------|-------|------|------|-------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↑↓ | | | | | | ↑ | ↗ | | ↖ | |
| Volume (vph) | 0 | 1861 | 69 | 0 | 0 | 0 | 0 | 158 | 106 | 37 | 102 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 0 | | 0 | 150 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 1 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.994 | | | | | | | 0.850 | | | |
| Flt Protected | | | | | | | | | | | | 0.987 |
| Satd. Flow (prot) | 0 | 3518 | 0 | 0 | 0 | 0 | 0 | 1863 | 1583 | 0 | 1839 | 0 |
| Flt Permitted | | | | | | | | | | | | 0.451 |
| Satd. Flow (perm) | 0 | 3518 | 0 | 0 | 0 | 0 | 0 | 1863 | 1583 | 0 | 840 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 5 | | | | | | | 144 | | | |
| Link Speed (mph) | | 30 | | | 45 | | | 30 | | | | 30 |
| Link Distance (ft) | | 122 | | | 1998 | | | 1145 | | | | 80 |
| Travel Time (s) | | 2.8 | | | 30.3 | | | 26.0 | | | | 1.8 |
| Peak Hour Factor | 0.92 | 0.99 | 0.82 | 0.92 | 0.92 | 0.92 | 0.92 | 0.78 | 0.83 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 2124 | 95 | 0 | 0 | 0 | 0 | 229 | 144 | 45 | 125 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 2219 | 0 | 0 | 0 | 0 | 0 | 229 | 144 | 0 | 170 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | | 2 | | | | | | 2 | 1 | 1 | 2 | |
| Detector Template | | Thru | | | | | | Thru | Right | Left | Thru | |
| Leading Detector (ft) | | 100 | | | | | | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | | 6 | | | | | | 6 | 20 | 20 | 6 | |
| Detector 1 Type | | Cl+Ex | | | | | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Turn Type | | NA | | | | | | NA | Perm | Perm | NA | |
| Protected Phases | | 2 | | | | | | 8 | | | 4 | |
| Permitted Phases | | | | | | | | | 8 | 4 | | |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 35: Russel Palmer & Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-----------------------|-----|-------|-----|-----|-----|-----|-----|-------|-------|-------|-------|-----|
| Detector Phase | | 2 | | | | | | 8 | 8 | 4 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | 15.0 | | | | | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Minimum Split (s) | | 21.3 | | | | | | 11.2 | 11.2 | 11.3 | 11.3 | |
| Total Split (s) | | 95.0 | | | | | | 31.0 | 31.0 | 31.0 | 31.0 | |
| Total Split (%) | | 63.3% | | | | | | 20.7% | 20.7% | 20.7% | 20.7% | |
| Maximum Green (s) | | 88.7 | | | | | | 24.8 | 24.8 | 24.7 | 24.7 | |
| Yellow Time (s) | | 4.3 | | | | | | 3.6 | 3.6 | 4.3 | 4.3 | |
| All-Red Time (s) | | 2.0 | | | | | | 2.6 | 2.6 | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | | | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | 6.3 | | | | | | 6.2 | 6.2 | | 6.3 | |
| Lead/Lag | | Lag | | | | | | | | | | |
| Lead-Lag Optimize? | | Yes | | | | | | | | | | |
| Vehicle Extension (s) | | 3.0 | | | | | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | | C-Max | | | | | | Max | Max | None | None | |
| Act Effect Green (s) | | 88.8 | | | | | | 24.8 | 24.8 | | 24.7 | |
| Actuated g/C Ratio | | 0.59 | | | | | | 0.17 | 0.17 | | 0.16 | |
| v/c Ratio | | 1.07 | | | | | | 0.74 | 0.38 | | 1.23 | |
| Control Delay | | 70.0 | | | | | | 75.1 | 10.9 | | 212.5 | |
| Queue Delay | | 0.0 | | | | | | 0.0 | 0.0 | | 0.0 | |
| Total Delay | | 70.0 | | | | | | 75.1 | 10.9 | | 212.5 | |
| LOS | | E | | | | | | E | B | | F | |
| Approach Delay | | 70.0 | | | | | | 50.3 | | | 212.5 | |
| Approach LOS | | E | | | | | | D | | | F | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 25 (17%), Referenced to phase 2:EBT and 6:, Start of Green |
| Natural Cycle: | 150 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.23 |
| Intersection Signal Delay: | 76.1 |
| Intersection LOS: | E |
| Intersection Capacity Utilization | 94.1% |
| ICU Level of Service | F |
| Analysis Period (min) | 15 |

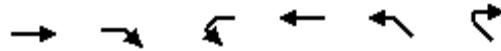
Splits and Phases: 35: Russel Palmer & Northpark Dr.



| Lane Group | ø1 | ø6 |
|-----------------------------|------|-------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 15.0 |
| Minimum Split (s) | 11.3 | 21.3 |
| Total Split (s) | 24.0 | 119.0 |
| Total Split (%) | 16% | 79% |
| Maximum Green (s) | 17.7 | 112.7 |
| Yellow Time (s) | 4.3 | 4.3 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | C-Max |
| Act Effect Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 36: Northpark Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NWL | NWR |
|----------------------------|------|-------|------|------|------|-------|
| Lane Configurations | ↑↑ | | | ↑↑ | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 3539 | 0 | 0 | 3539 | 0 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 3539 | 0 | 0 | 3539 | 0 | 0 |
| Link Speed (mph) | 45 | | | 30 | 45 | |
| Link Distance (ft) | 1638 | | | 2832 | 2834 | |
| Travel Time (s) | 24.8 | | | 64.4 | 42.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 0 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 51.5% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
43: Sorters Rd & US 59 SBFR

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|-------|
| Lane Configurations | | ↑↑↑ | | ↖ | ↑↑ | | | | | | ↖↑ | ↖ |
| Volume (vph) | 0 | 21 | 110 | 291 | 252 | 0 | 0 | 0 | 0 | 103 | 19 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 150 | 200 | | 0 | 0 | | 0 | 0 | | 150 |
| Storage Lanes | 0 | | 1 | 1 | | 0 | 0 | | 0 | 0 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.91 | 0.91 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.879 | | | | | | | | | | 0.850 |
| Flt Protected | | | | 0.950 | | | | | | | 0.961 | |
| Satd. Flow (prot) | 0 | 4470 | 0 | 1770 | 3539 | 0 | 0 | 0 | 0 | 0 | 3401 | 1583 |
| Flt Permitted | | | | 0.642 | | | | | | | 0.961 | |
| Satd. Flow (perm) | 0 | 4470 | 0 | 1196 | 3539 | 0 | 0 | 0 | 0 | 0 | 3401 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 135 | | | | | | | | | | 49 |
| Link Speed (mph) | | 35 | | | 35 | | | 30 | | | | 30 |
| Link Distance (ft) | | 893 | | | 863 | | | 983 | | | | 6715 |
| Travel Time (s) | | 17.4 | | | 16.8 | | | 22.3 | | | | 152.6 |
| Peak Hour Factor | 0.92 | 0.75 | 0.92 | 0.78 | 0.86 | 0.92 | 0.92 | 0.92 | 0.92 | 0.74 | 0.59 | 0.80 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 32 | 135 | 422 | 331 | 0 | 0 | 0 | 0 | 157 | 36 | 49 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 167 | 0 | 422 | 331 | 0 | 0 | 0 | 0 | 0 | 193 | 49 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | | NA | | Perm | NA | | | | | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | | | | | 6 | |
| Permitted Phases | | | | 8 | | | | | | 6 | | 6 |
| Minimum Split (s) | | 20.0 | | 20.0 | 20.0 | | | | | 20.0 | 20.0 | 20.0 |
| Total Split (s) | | 20.0 | | 20.0 | 20.0 | | | | | 20.0 | 20.0 | 20.0 |
| Total Split (%) | | 50.0% | | 50.0% | 50.0% | | | | | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | | 16.0 | | 16.0 | 16.0 | | | | | 16.0 | 16.0 | 16.0 |
| Yellow Time (s) | | 3.5 | | 3.5 | 3.5 | | | | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | | 0.5 | | 0.5 | 0.5 | | | | | 0.5 | 0.5 | 0.5 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | | | | | | 0.0 | 0.0 |
| Total Lost Time (s) | | 4.0 | | 4.0 | 4.0 | | | | | | 4.0 | 4.0 |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | | 5.0 | | 5.0 | 5.0 | | | | | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 11.0 | | 11.0 | 11.0 | | | | | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | 0 | 0 | | | | | 0 | 0 | 0 |
| Act Effect Green (s) | | 16.0 | | 16.0 | 16.0 | | | | | | 16.0 | 16.0 |
| Actuated g/C Ratio | | 0.40 | | 0.40 | 0.40 | | | | | | 0.40 | 0.40 |
| v/c Ratio | | 0.09 | | 0.88 | 0.23 | | | | | | 0.14 | 0.07 |

Alternative E: Direct Connector Kingwood to US 59
 43: Sorters Rd & US 59 SBFR

PM Peak Hour

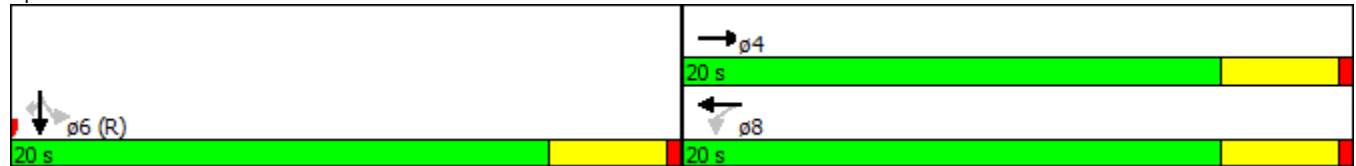


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|-----|-----|-----|------|------|-----|-----|-----|-----|-----|-----|-----|
| Control Delay | | 2.9 | | 33.9 | 4.8 | | | | | | 8.0 | 3.4 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | | | | | | 0.0 | 0.0 |
| Total Delay | | 2.9 | | 33.9 | 4.8 | | | | | | 8.0 | 3.4 |
| LOS | | A | | C | A | | | | | | A | A |
| Approach Delay | | 2.9 | | | 21.1 | | | | | | 7.1 | |
| Approach LOS | | A | | | C | | | | | | A | |

Intersection Summary

| | |
|-----------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 40 |
| Actuated Cycle Length: | 40 |
| Offset: | 0 (0%), Referenced to phase 2: and 6:SBTL, Start of Green |
| Natural Cycle: | 50 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.88 |
| Intersection Signal Delay: | 15.6 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 38.0% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 43: Sorters Rd & US 59 SBFR



Alternative E: Direct Connector Kingwood to US 59
45: Loop 494 & Sorters Rd

PM Peak Hour



| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 63 | 55 | 291 | 613 | 251 | 88 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | 150 | 180 | | | 225 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (ft) | 25 | | 25 | | | |
| Lane Util. Factor | 0.97 | 0.88 | 0.97 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3433 | 2787 | 3433 | 3539 | 3539 | 1583 |
| Flt Permitted | 0.950 | | 0.537 | | | |
| Satd. Flow (perm) | 3433 | 2787 | 1941 | 3539 | 3539 | 1583 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 82 | | | | 133 |
| Link Speed (mph) | 30 | | | 45 | 45 | |
| Link Distance (ft) | 863 | | | 804 | 572 | |
| Travel Time (s) | 19.6 | | | 12.2 | 8.7 | |
| Peak Hour Factor | 0.75 | 0.76 | 0.89 | 0.92 | 0.79 | 0.75 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 95 | 82 | 369 | 753 | 359 | 133 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 95 | 82 | 369 | 753 | 359 | 133 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 36 | | | 24 | 24 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 |
| Turn Type | NA | Perm | Perm | NA | NA | Perm |
| Protected Phases | 4 | | | 2 | 6 | |
| Permitted Phases | | 4 | 2 | | | 6 |
| Minimum Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Total Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effect Green (s) | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 |
| v/c Ratio | 0.07 | 0.07 | 0.48 | 0.53 | 0.25 | 0.19 |

Alternative E: Direct Connector Kingwood to US 59
 45: Loop 494 & Sorters Rd

PM Peak Hour

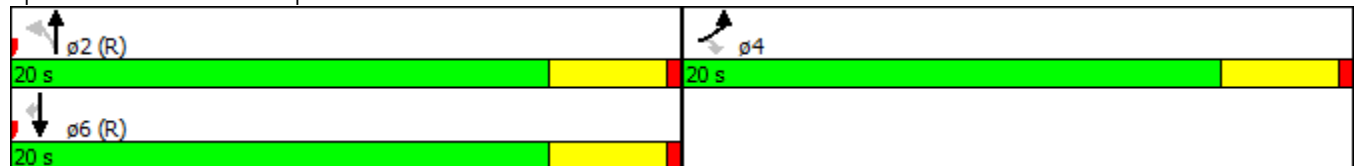


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|----------------|-----|-----|------|------|-----|-----|
| Control Delay | 2.1 | 0.3 | 11.5 | 10.9 | 8.6 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.1 | 0.3 | 11.5 | 10.9 | 8.6 | 2.9 |
| LOS | A | A | B | B | A | A |
| Approach Delay | 1.2 | | | 11.1 | 7.1 | |
| Approach LOS | A | | | B | A | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 40 |
| Actuated Cycle Length: | 40 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green |
| Natural Cycle: | 40 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.53 |
| Intersection Signal Delay: | 9.0 |
| Intersection LOS: | A |
| Intersection Capacity Utilization | 30.6% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 45: Loop 494 & Sorters Rd



Alternative E: Direct Connector Kingwood to US 59
 49: Hamblen & Laurel Springs

PM Peak Hour



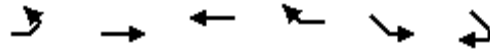
| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|----------------------------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 185 | 840 | 174 | 12 | 6 | 61 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.987 | | 0.877 | |
| Flt Protected | | 0.990 | | | 0.996 | |
| Satd. Flow (prot) | 0 | 1844 | 1839 | 0 | 1627 | 0 |
| Flt Permitted | | 0.990 | | | 0.996 | |
| Satd. Flow (perm) | 0 | 1844 | 1839 | 0 | 1627 | 0 |
| Link Speed (mph) | | 30 | 30 | | 30 | |
| Link Distance (ft) | | 1799 | 1596 | | 734 | |
| Travel Time (s) | | 40.9 | 36.3 | | 16.7 | |
| Peak Hour Factor | 0.89 | 0.99 | 0.75 | 0.50 | 0.75 | 0.76 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 235 | 959 | 262 | 27 | 9 | 91 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 1194 | 289 | 0 | 100 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(ft) | | 0 | 0 | | 40 | |
| Link Offset(ft) | | 0 | 0 | | 0 | |
| Crosswalk Width(ft) | | 16 | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | | 9 | 15 | 9 |
| Sign Control | | Free | Free | | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 87.3% |
| Analysis Period (min) | 15 |
| | ICU Level of Service E |

Alternative E: Direct Connector Kingwood to US 59
53: Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | WBT | WBR | SEL | SER |
|----------------------------|------|------|------|-------|------|-------|
| Lane Configurations | | ↑↑ | ↑↑ | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 3539 | 3539 | 0 | 0 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 3539 | 3539 | 0 | 0 | 0 |
| Link Speed (mph) | | 30 | 30 | | 30 | |
| Link Distance (ft) | | 736 | 252 | | 743 | |
| Travel Time (s) | | 16.7 | 5.7 | | 16.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(ft) | | 40 | 40 | | 40 | |
| Link Offset(ft) | | 0 | 0 | | 0 | |
| Crosswalk Width(ft) | | 16 | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | | 9 | 15 | 9 |
| Sign Control | | Free | Free | | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
54: Woodland Hills & Hamblen

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|------|-------|------|------|-------|------|------|-------|------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | | | | | | | |
| Flt Protected | | | | | | | | | | | | |
| Satd. Flow (prot) | 1863 | 0 | 0 | 0 | 0 | 1863 | 0 | 1863 | 0 | 0 | 1863 | 0 |
| Flt Permitted | | | | | | | | | | | | |
| Satd. Flow (perm) | 1863 | 0 | 0 | 0 | 0 | 1863 | 0 | 1863 | 0 | 0 | 1863 | 0 |
| Link Speed (mph) | 30 | | | | 30 | | | | 30 | | 30 | |
| Link Distance (ft) | 6657 | | | | 795 | | | | 912 | | 3265 | |
| Travel Time (s) | 151.3 | | | | 18.1 | | | | 20.7 | | 74.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | 0% | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | 12 | | | | 12 | | | | 0 | | 0 | |
| Link Offset(ft) | 0 | | | | 0 | | | | 0 | | 0 | |
| Crosswalk Width(ft) | 16 | | | | 16 | | | | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | Stop | | | | Stop | | | | Stop | | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
57: Redbud & Hamblen

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Volume (vph) | 15 | 43 | 10 | 1 | 17 | 0 | 93 | 53 | 1 | 3 | 32 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.968 | | | | | | 0.996 | | | 0.964 | |
| Flt Protected | | 0.988 | | | 0.991 | | | 0.969 | | | 0.995 | |
| Satd. Flow (prot) | 0 | 1781 | 0 | 0 | 1846 | 0 | 0 | 1798 | 0 | 0 | 1787 | 0 |
| Flt Permitted | | 0.988 | | | 0.991 | | | 0.969 | | | 0.995 | |
| Satd. Flow (perm) | 0 | 1781 | 0 | 0 | 1846 | 0 | 0 | 1798 | 0 | 0 | 1787 | 0 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 753 | | | 6657 | | | 439 | | | 363 | |
| Travel Time (s) | | 17.1 | | | 151.3 | | | 10.0 | | | 8.3 | |
| Peak Hour Factor | 0.63 | 0.83 | 0.42 | 0.25 | 0.85 | 0.25 | 0.86 | 0.95 | 0.25 | 0.38 | 0.67 | 0.65 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 27 | 59 | 27 | 5 | 23 | 0 | 122 | 63 | 5 | 9 | 54 | 23 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 113 | 0 | 0 | 28 | 0 | 0 | 190 | 0 | 0 | 86 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 32.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
60: Forest Cove & Hamblen

PM Peak Hour































| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|------|-------|-------|------|-------|-------|------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 520 | 140 | 51 | 1 | 49 | 2 | 16 | 16 | 3 | 3 | 27 | 75 |
| Ideal Flow (vphp) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 1 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.951 | | | 0.987 | | | 0.981 | | | 0.911 | |
| Flt Protected | 0.950 | | | | 0.997 | | | 0.982 | | | 0.997 | |
| Satd. Flow (prot) | 1770 | 1771 | 0 | 0 | 1833 | 0 | 0 | 1794 | 0 | 0 | 1692 | 0 |
| Flt Permitted | 0.950 | | | | 0.997 | | | 0.982 | | | 0.997 | |
| Satd. Flow (perm) | 1770 | 1771 | 0 | 0 | 1833 | 0 | 0 | 1794 | 0 | 0 | 1692 | 0 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1966 | | | 1019 | | | 472 | | | 603 | |
| Travel Time (s) | | 44.7 | | | 23.2 | | | 10.7 | | | 13.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.67 | 0.25 | 0.68 | 0.25 | 0.80 | 0.57 | 0.38 | 0.38 | 0.61 | 0.75 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 653 | 176 | 86 | 5 | 81 | 9 | 23 | 32 | 9 | 9 | 50 | 113 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 653 | 262 | 0 | 0 | 95 | 0 | 0 | 64 | 0 | 0 | 172 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |

Intersection Summary

| | |
|-----------------------------------|--------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 54.7% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
64: Woodland Hills & Kingwood Dr.

PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
| Lane Configurations |   |   |  |   |   |  |  |  |  |  |  |  |
| Volume (vph) | 379 | 1506 | 107 | 229 | 1013 | 144 | 35 | 210 | 302 | 126 | 221 | 285 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 150 | 150 | | 150 | 150 | | 0 | 150 | | 0 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 153 | | | 153 | | | 233 | | | 257 |
| Link Speed (mph) | | 40 | | | 40 | | | 35 | | | | 35 |
| Link Distance (ft) | | 275 | | | 1473 | | | 652 | | | | 2207 |
| Travel Time (s) | | 4.7 | | | 25.1 | | | 12.7 | | | | 43.0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% |
| Adj. Flow (vph) | 482 | 1915 | 136 | 291 | 1288 | 183 | 45 | 267 | 384 | 160 | 281 | 362 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 482 | 1915 | 136 | 291 | 1288 | 183 | 45 | 267 | 384 | 160 | 281 | 362 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 70 | | | 75 | | | 20 | | | | 30 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 5 15 | 2 | | 1 | 6 | | 3 | 8 | | 7 | 4 | |
| Permitted Phases | | | 2 | | | 6 | | | 8 | | | 4 |

| Lane Group | ø5 | ø15 |
|----------------------------|----|-----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 5 | 15 |
| Permitted Phases | | |

| Lane Group | ø5 | ø15 |
|-------------------------|------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 7.0 | 4.0 |
| Minimum Split (s) | 13.0 | 10.0 |
| Total Split (s) | 22.0 | 10.0 |
| Total Split (%) | 15% | 7% |
| Maximum Green (s) | 16.0 | 4.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | None |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
69: Kingwood Dr. & High Valley

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 8 | 24 | 0 | 0 | 102 | 42 | 7 | 285 | 129 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | 0.956 | | | 0.954 | | | | |
| Flt Protected | 0.950 | 0.998 | | | | | | 0.999 | | | | |
| Satd. Flow (prot) | 1681 | 1766 | 0 | 0 | 3383 | 0 | 0 | 3373 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | 0.998 | | | | | | 0.999 | | | | |
| Satd. Flow (perm) | 1681 | 1766 | 0 | 0 | 3383 | 0 | 0 | 3373 | 0 | 0 | 0 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 35 | | | 76 | | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 40 | | | | 40 |
| Link Distance (ft) | | 140 | | | 765 | | | 1296 | | | | 1387 |
| Travel Time (s) | | 3.2 | | | 17.4 | | | 22.1 | | | | 23.6 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 10 | 29 | 0 | 0 | 125 | 52 | 9 | 350 | 158 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | 10% | | | | | | | | | | | |
| Lane Group Flow (vph) | 9 | 30 | 0 | 0 | 177 | 0 | 0 | 517 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | | 0 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Prot | NA | | | NA | | Prot | NA | | | | |
| Protected Phases | 1 4 | 4 | | | 8 | | 15 | 2 | | | | |
| Permitted Phases | | | | | | | | | | | | |
| Minimum Split (s) | | 10.0 | | | 18.0 | | 11.0 | 20.0 | | | | |
| Total Split (s) | | 14.0 | | | 25.0 | | 18.0 | 78.0 | | | | |
| Total Split (%) | | 9.3% | | | 16.7% | | 12.0% | 52.0% | | | | |
| Maximum Green (s) | | 9.0 | | | 20.0 | | 12.0 | 72.0 | | | | |
| Yellow Time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | | | |
| All-Red Time (s) | | 1.0 | | | 1.0 | | 2.0 | 2.0 | | | | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 6.0 | | | | |
| Lead/Lag | | Lead | | | Lag | | | Lead | | | | |
| Lead-Lag Optimize? | | Yes | | | Yes | | | Yes | | | | |
| Walk Time (s) | | | | | 6.0 | | | 4.0 | | | | |
| Flash Dont Walk (s) | | | | | 7.0 | | | 10.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | 0 | | | 0 | | | | |
| Act Effct Green (s) | 23.0 | 24.0 | | | 20.0 | | | 84.0 | | | | |
| Actuated g/C Ratio | 0.15 | 0.16 | | | 0.13 | | | 0.56 | | | | |
| v/c Ratio | 0.04 | 0.11 | | | 0.37 | | | 0.49 | | | | |
| Control Delay | 43.0 | 43.3 | | | 49.7 | | | 13.7 | | | | |
| Queue Delay | 1.9 | 5.9 | | | 0.0 | | | 0.0 | | | | |
| Total Delay | 44.9 | 49.2 | | | 49.7 | | | 13.7 | | | | |

Alternative E: Direct Connector Kingwood to US 59
 69: Kingwood Dr. & High Valley

PM Peak Hour

| Lane Group | ø1 | ø6 |
|----------------------------|------|------|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |
| Minimum Split (s) | 11.0 | 10.0 |
| Total Split (s) | 15.0 | 93.0 |
| Total Split (%) | 10% | 62% |
| Maximum Green (s) | 9.0 | 87.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |

Alternative E: Direct Connector Kingwood to US 59
 69: Kingwood Dr. & High Valley

PM Peak Hour

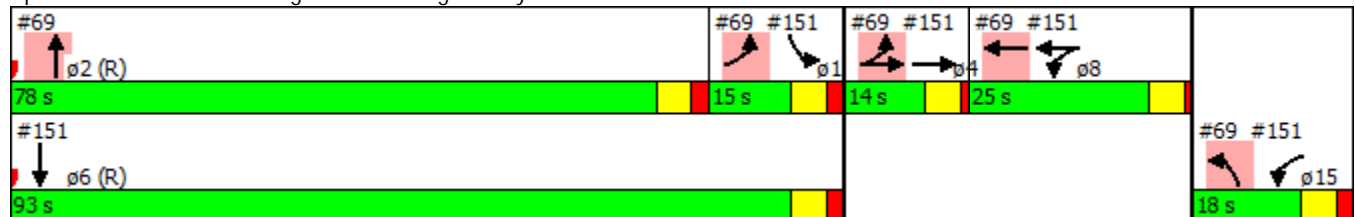


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|-----|------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|
| LOS | D | D | | | D | | | B | | | | |
| Approach Delay | | 48.2 | | | 49.7 | | | 13.7 | | | | |
| Approach LOS | | D | | | D | | | B | | | | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 48 (32%), Referenced to phase 2:NBT and 6:, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.49 |
| Intersection Signal Delay: | 24.3 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 27.7% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 69: Kingwood Dr. & High Valley



| Lane Group | ø1 | ø6 |
|----------------------|----|----|
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
73: Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | ↑↑ | ↗ | | | | | ↑ | ↗ | ↘ | ↑ | |
| Volume (vph) | 13 | 1769 | 186 | 0 | 0 | 0 | 0 | 49 | 59 | 29 | 79 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 150 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 1 | 0 | | 0 | 0 | | 1 | 1 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Fr _t | | | 0.850 | | | | | | 0.850 | | | |
| Fl _t Protected | | | | | | | | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 3539 | 1583 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Fl _t Permitted | | | | | | | | | | 0.718 | | |
| Satd. Flow (perm) | 0 | 3539 | 1583 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1337 | 1863 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 172 | | | | | | 14 | | | |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1998 | | | 2386 | | | 197 | | | 106 | |
| Travel Time (s) | | 30.3 | | | 36.2 | | | 4.5 | | | 2.4 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 16 | 2173 | 228 | 0 | 0 | 0 | 0 | 60 | 72 | 36 | 97 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 2189 | 228 | 0 | 0 | 0 | 0 | 60 | 72 | 36 | 97 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | | | | | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | Right | | | | | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | | | | | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | | | | | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | | | | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | Perm | | | | | NA | Perm | Perm | NA | |
| Protected Phases | | 4 | | | | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | | | | | | 2 | 6 | | |

| | |
|----------------------------|----|
| Lane Group | ø8 |
| Lane Configurations | |
| Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (ft) | |
| Storage Lanes | |
| Taper Length (ft) | |
| Lane Util. Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Growth Factor | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 8 |
| Permitted Phases | |

Alternative E: Direct Connector Kingwood to US 59
73: Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-----|-----|-----|-----|-------|-------|-------|-------|-----|
| Detector Phase | 4 | 4 | 4 | | | | | 2 | 2 | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | | | | | 4.0 | 4.0 | 4.0 | 4.0 | |
| Minimum Split (s) | 20.0 | 20.0 | 20.0 | | | | | 20.0 | 20.0 | 20.0 | 20.0 | |
| Total Split (s) | 65.0 | 65.0 | 65.0 | | | | | 25.0 | 25.0 | 25.0 | 25.0 | |
| Total Split (%) | 72.2% | 72.2% | 72.2% | | | | | 27.8% | 27.8% | 27.8% | 27.8% | |
| Maximum Green (s) | 61.0 | 61.0 | 61.0 | | | | | 21.0 | 21.0 | 21.0 | 21.0 | |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | | | | | 3.5 | 3.5 | 3.5 | 3.5 | |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | | | | | 0.5 | 0.5 | 0.5 | 0.5 | |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | | 4.0 | 4.0 | | | | | 4.0 | 4.0 | 4.0 | 4.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | | | | | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | None | | | | | C-Max | C-Max | C-Max | C-Max | |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | | | | | 5.0 | 5.0 | 5.0 | 5.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | | | | | 11.0 | 11.0 | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | | | | | 0 | 0 | 0 | 0 | |
| Act Effect Green (s) | | 61.0 | 61.0 | | | | | 21.0 | 21.0 | 21.0 | 21.0 | |
| Actuated g/C Ratio | | 0.68 | 0.68 | | | | | 0.23 | 0.23 | 0.23 | 0.23 | |
| v/c Ratio | | 0.91 | 0.20 | | | | | 0.14 | 0.19 | 0.12 | 0.22 | |
| Control Delay | | 19.8 | 2.0 | | | | | 28.4 | 24.6 | 28.5 | 29.9 | |
| Queue Delay | | 46.9 | 0.0 | | | | | 0.0 | 0.0 | 13.1 | 82.3 | |
| Total Delay | | 66.7 | 2.0 | | | | | 28.4 | 24.6 | 41.6 | 112.2 | |
| LOS | | E | A | | | | | C | C | D | F | |
| Approach Delay | | 60.6 | | | | | | 26.3 | | | 93.1 | |
| Approach LOS | | E | | | | | | C | | | F | |

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 60.6
 Intersection LOS: E
 Intersection Capacity Utilization 113.1%
 ICU Level of Service H
 Analysis Period (min) 15


















Splits and Phases: 73: Northpark Dr.



| | |
|-------------------------|------|
| Lane Group | ø8 |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 4.0 |
| Minimum Split (s) | 20.0 |
| Total Split (s) | 65.0 |
| Total Split (%) | 72% |
| Maximum Green (s) | 61.0 |
| Yellow Time (s) | 3.5 |
| All-Red Time (s) | 0.5 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Walk Time (s) | 5.0 |
| Flash Dont Walk (s) | 11.0 |
| Pedestrian Calls (#/hr) | 0 |
| Act Effect Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Intersection Summary | |

Alternative E: Direct Connector Kingwood to US 59
74: Kingwood Dr. & Willow Terrace

PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SBL | SBR | SEL | SET | SER | NWL | NWT | NWR | NEL2 | NEL | NER | ø1 |
| Lane Configurations | | | |  | | |  | |  |  |  | |
| Volume (vph) | 0 | 0 | 2 | 51 | 0 | 0 | 306 | 37 | 80 | 494 | 483 | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | |
| Storage Length (ft) | 0 | 0 | 0 | | 0 | 0 | | 0 | | 150 | 150 | |
| Storage Lanes | 0 | 0 | 0 | | 0 | 0 | | 0 | | 1 | 1 | |
| Taper Length (ft) | 25 | | 25 | | | 25 | | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.97 | 1.00 | |
| Fr _t | | | | | | | 0.979 | | | | | 0.850 |
| Fl _t Protected | | | | 0.997 | | | | | 0.950 | 0.950 | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3529 | 0 | 0 | 3465 | 0 | 1770 | 3433 | 1583 | |
| Fl _t Permitted | | | | 0.997 | | | | | 0.950 | 0.950 | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3529 | 0 | 0 | 3465 | 0 | 1770 | 3433 | 1583 | |
| Right Turn on Red | | | | | Yes | | | Yes | | | Yes | |
| Satd. Flow (RTOR) | | | | | | | 22 | | | | 563 | |
| Link Speed (mph) | 40 | | | 30 | | | 30 | | | 30 | | |
| Link Distance (ft) | 525 | | | 105 | | | 533 | | | 1469 | | |
| Travel Time (s) | 8.9 | | | 2.4 | | | 12.1 | | | 33.4 | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.50 | 0.75 | 0.92 | 0.92 | 0.87 | 0.66 | 0.74 | 0.92 | 0.97 | |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | |
| Adj. Flow (vph) | 0 | 0 | 5 | 77 | 0 | 0 | 397 | 63 | 122 | 607 | 563 | |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 82 | 0 | 0 | 460 | 0 | 122 | 607 | 563 | |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | |
| Lane Alignment | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right | |
| Median Width(ft) | 0 | | | 0 | | | 0 | | | 36 | | |
| Link Offset(ft) | 0 | | | 0 | | | 0 | | | 0 | | |
| Crosswalk Width(ft) | 16 | | | 16 | | | 16 | | | 16 | | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Turning Speed (mph) | 15 | 9 | 15 | | 9 | 15 | | 9 | 15 | 15 | 9 | |
| Turn Type | | | Prot | NA | | | NA | | Prot | NA | Perm | |
| Protected Phases | | | 1 4 | 4 | | | 8 | | 15 | 2 | | 1 |
| Permitted Phases | | | | | | | | | | | | 2 |
| Minimum Split (s) | | | | 10.0 | | | 18.0 | | 11.0 | 20.0 | 20.0 | 11.0 |
| Total Split (s) | | | | 10.0 | | | 18.0 | | 11.0 | 20.0 | 20.0 | 11.0 |
| Total Split (%) | | | | 14.3% | | | 25.7% | | 15.7% | 28.6% | 28.6% | 16% |
| Maximum Green (s) | | | | 5.0 | | | 13.0 | | 5.0 | 14.0 | 14.0 | 5.0 |
| Yellow Time (s) | | | | 4.0 | | | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | | | | 1.0 | | | 1.0 | | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | | | | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | | | | 5.0 | | | 5.0 | | 6.0 | 6.0 | 6.0 | |
| Lead/Lag | | | | Lead | | | Lag | | Lead | Lead | Lag | |
| Lead-Lag Optimize? | | | | Yes | | | Yes | | Yes | Yes | Yes | Yes |
| Walk Time (s) | | | | | | | 6.0 | | 4.0 | 4.0 | | |
| Flash Dont Walk (s) | | | | | | | 7.0 | | 10.0 | 10.0 | | |
| Pedestrian Calls (#/hr) | | | | | | | 0 | | 0 | 0 | | |
| Act Effct Green (s) | | | | 16.0 | | | 13.0 | | 5.0 | 14.0 | 14.0 | |
| Actuated g/C Ratio | | | | 0.23 | | | 0.19 | | 0.07 | 0.20 | 0.20 | |
| v/c Ratio | | | | 0.10 | | | 0.70 | | 0.97 | 0.88 | 0.73 | |

| Lane Group | ø6 |
|----------------------------|------|
| Lane Configurations | |
| Volume (vph) | |
| Ideal Flow (vphpl) | |
| Storage Length (ft) | |
| Storage Lanes | |
| Taper Length (ft) | |
| Lane Util. Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Growth Factor | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Turn Type | |
| Protected Phases | 6 |
| Permitted Phases | |
| Minimum Split (s) | 10.0 |
| Total Split (s) | 31.0 |
| Total Split (%) | 44% |
| Maximum Green (s) | 25.0 |
| Yellow Time (s) | 4.0 |
| All-Red Time (s) | 2.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Walk Time (s) | |
| Flash Dont Walk (s) | |
| Pedestrian Calls (#/hr) | |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |

Alternative E: Direct Connector Kingwood to US 59
 74: Kingwood Dr. & Willow Terrace

PM Peak Hour

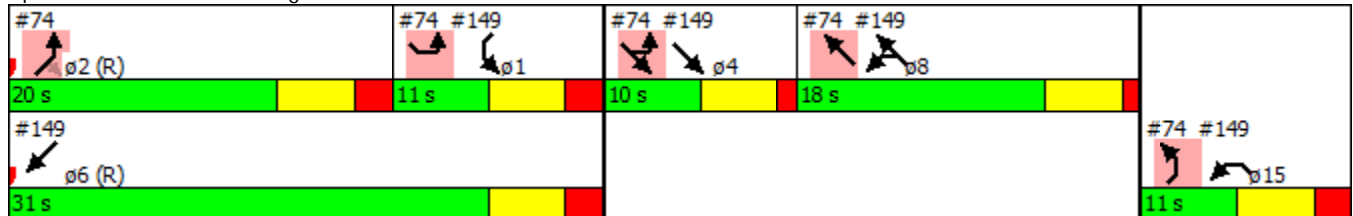


| Lane Group | SBL | SBR | SEL | SET | SER | NWL | NWT | NWR | NEL2 | NEL | NER | ø1 |
|----------------|-----|-----|-----|-----|-----|-----|------|-----|-------|------|-----|----|
| Control Delay | | | | 6.3 | | | 31.7 | | 110.5 | 44.4 | 9.3 | |
| Queue Delay | | | | 1.4 | | | 0.0 | | 0.0 | 0.0 | 0.0 | |
| Total Delay | | | | 7.7 | | | 31.7 | | 110.5 | 44.4 | 9.3 | |
| LOS | | | | A | | | C | | F | D | A | |
| Approach Delay | | | | 7.7 | | | 31.7 | | | 35.3 | | |
| Approach LOS | | | | A | | | C | | | D | | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 70 |
| Actuated Cycle Length: | 70 |
| Offset: | 0 (0%), Referenced to phase 2:NEL and 6:, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.97 |
| Intersection Signal Delay: | 33.2 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 47.1% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 74: Kingwood Dr. & Willow Terrace



| | |
|----------------------|----|
| Lane Group | ø6 |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Intersection Summary | |

Alternative E: Direct Connector Kingwood to US 59
77: Timber Shade Dr. & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|------|------|-------|------|-------|-------|------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 115 | 1074 | 48 | 0 | 0 | 0 | 0 | 33 | 0 | 9 | 3 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 1 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.992 | | | | | | | | | | |
| Flt Protected | 0.950 | | | | | | | | | | 0.973 | |
| Satd. Flow (prot) | 1770 | 3511 | 0 | 0 | 0 | 0 | 0 | 3539 | 0 | 0 | 3444 | 0 |
| Flt Permitted | 0.950 | | | | | | | | | | 0.973 | |
| Satd. Flow (perm) | 1770 | 3511 | 0 | 0 | 0 | 0 | 0 | 3539 | 0 | 0 | 3444 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 5 | | | | | | | | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 826 | | | 1617 | | | 741 | | | 136 | |
| Travel Time (s) | | 18.8 | | | 36.8 | | | 16.8 | | | 3.1 | |
| Peak Hour Factor | 0.90 | 0.96 | 0.80 | 0.92 | 0.92 | 0.92 | 0.92 | 0.69 | 0.25 | 0.56 | 0.25 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 144 | 1264 | 68 | 0 | 0 | 0 | 0 | 54 | 0 | 18 | 14 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 144 | 1332 | 0 | 0 | 0 | 0 | 0 | 54 | 0 | 0 | 32 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Prot | NA | | | | | | NA | | Prot | NA | |
| Protected Phases | 15 | 2 | | | | | | 8 | | 14 | 4 | |
| Permitted Phases | | | | | | | | | | | | |
| Minimum Split (s) | 11.0 | 20.0 | | | | | | 18.0 | | | 10.0 | |
| Total Split (s) | 27.0 | 82.0 | | | | | | 18.0 | | | 12.0 | |
| Total Split (%) | 18.0% | 54.7% | | | | | | 12.0% | | | 8.0% | |
| Maximum Green (s) | 21.0 | 76.0 | | | | | | 13.0 | | | 7.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | | | | | 4.0 | | | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | | | | | 1.0 | | | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | | | | 5.0 | | | 5.0 | |
| Lead/Lag | | Lead | | | | | | Lag | | | Lead | |
| Lead-Lag Optimize? | | Yes | | | | | | Yes | | | Yes | |
| Walk Time (s) | | 4.0 | | | | | | 6.0 | | | | |
| Flash Dont Walk (s) | | 10.0 | | | | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) | | 0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 21.0 | 76.0 | | | | | | 13.0 | | | 18.0 | |
| Actuated g/C Ratio | 0.14 | 0.51 | | | | | | 0.09 | | | 0.12 | |
| v/c Ratio | 0.58 | 0.75 | | | | | | 0.18 | | | 0.08 | |

| Lane Group | ø1 | ø6 |
|----------------------------|------|------|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |
| Minimum Split (s) | 11.0 | 10.0 |
| Total Split (s) | 11.0 | 93.0 |
| Total Split (%) | 7% | 62% |
| Maximum Green (s) | 5.0 | 87.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |

Alternative E: Direct Connector Kingwood to US 59
 77: Timber Shade Dr. & Kingwood Dr.

PM Peak Hour

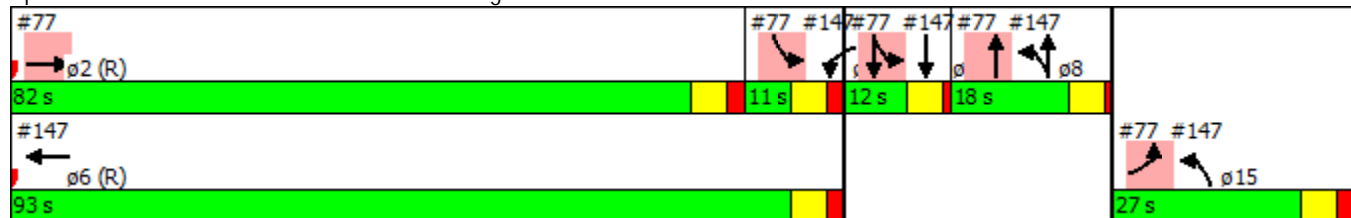


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|------|------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|
| Control Delay | 70.8 | 32.6 | | | | | | 65.1 | | | 41.9 | |
| Queue Delay | 0.0 | 0.0 | | | | | | 0.0 | | | 1.6 | |
| Total Delay | 70.8 | 32.6 | | | | | | 65.1 | | | 43.5 | |
| LOS | E | C | | | | | | E | | | D | |
| Approach Delay | | 36.3 | | | | | | 65.1 | | | 43.5 | |
| Approach LOS | | D | | | | | | E | | | D | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 48 (32%), Referenced to phase 2:EBT and 6:, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.75 |
| Intersection Signal Delay: | 37.4 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 51.7% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 77: Timber Shade Dr. & Kingwood Dr.



| Lane Group | ø1 | ø6 |
|----------------------|----|----|
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
80: Kingwood Dr.

PM Peak Hour



| Lane Group | WBL | WBR | NET | NER | SWL | SWT |
|----------------------------|------|-------|------|-------|------|------|
| Lane Configurations | | | ↑↑ | | | ↑↑ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 3539 | 0 | 0 | 3539 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 3539 | 0 | 0 | 3539 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 826 | | 596 | | | 833 |
| Travel Time (s) | 18.8 | | 13.5 | | | 18.9 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 80 | | 80 | | | 80 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Free | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
 81: US 59 SBFR

PM Peak Hour



| Lane Group | NBT | NBR | SBU | SBL | SBT | NWL | NWR |
|----------------------------|------|-------|-------|------|------|------|-------|
| Lane Configurations | | | ⬇ | | ⬆⬆⬆⬆ | | |
| Volume (vph) | 0 | 0 | 188 | 0 | 549 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.81 | 1.00 | 1.00 |
| Frt | | | | | | | |
| Flt Protected | | | 0.950 | | | | |
| Satd. Flow (prot) | 0 | 0 | 1770 | 0 | 7544 | 0 | 0 |
| Flt Permitted | | | 0.950 | | | | |
| Satd. Flow (perm) | 0 | 0 | 1770 | 0 | 7544 | 0 | 0 |
| Link Speed (mph) | 30 | | | | 30 | 30 | |
| Link Distance (ft) | 304 | | | | 1812 | 283 | |
| Travel Time (s) | 6.9 | | | | 41.2 | 6.4 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 231 | 0 | 674 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 231 | 0 | 674 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No |
| Lane Alignment | Left | Right | R NA | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | | 12 | 0 | |
| Link Offset(ft) | 0 | | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 9 | 15 | | 15 | 9 |
| Sign Control | Stop | | | | Free | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 35.5% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
 83: US 59 NBFR

PM Peak Hour



| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|----------------------------|-------|-------|------|------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 188 | 0 | 0 | 986 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1770 | 0 | 0 | 5085 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1770 | 0 | 0 | 5085 | 0 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 283 | | | 309 | 1638 | |
| Travel Time (s) | 6.4 | | | 7.0 | 37.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 231 | 0 | 0 | 1211 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 231 | 0 | 0 | 1211 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 0 | 0 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 |
| Sign Control | Yield | | | Free | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 35.5% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
 84: US 59 SBFR

PM Peak Hour



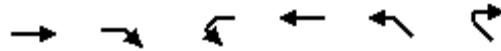
| Lane Group | EBL | EBR | NBL | NBT | NBR | SBL | SBT | SBR | SWL | SWR |
|----------------------------|------|-------|------|-------|-------|------|------|-------|-------|-------|
| Lane Configurations | | | | | | | 6 | | 7 | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 1079 | 0 | 246 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.76 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | | | | | |
| Flt Protected | | | | | | | | | 0.950 | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 0 | 0 | 8494 | 0 | 1770 | 0 |
| Flt Permitted | | | | | | | | | 0.950 | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 0 | 0 | 8494 | 0 | 1770 | 0 |
| Link Speed (mph) | 30 | | | 30 | | | 30 | | 30 | |
| Link Distance (ft) | 48 | | | 6181 | | | 368 | | 362 | |
| Travel Time (s) | 1.1 | | | 140.5 | | | 8.4 | | 8.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 1325 | 0 | 302 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 1325 | 0 | 302 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Right | Left | Left | Right | Left | Right |
| Median Width(ft) | 0 | | | 0 | | | 0 | | 12 | |
| Link Offset(ft) | 0 | | | 0 | | | 0 | | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | | | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | | 9 | 15 | | 9 | 15 | 9 |
| Sign Control | Stop | | | Stop | | | Free | | Yield | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 33.8% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
87: Kingwood Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NWL | NWR |
|----------------------------|------|-------|------|------|------|-------|
| Lane Configurations | | ↑↑ | | ↑↑ | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 0.88 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 3278 | 0 | 3539 | 0 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 3278 | 0 | 3539 | 0 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1473 | | | 540 | 4245 | |
| Travel Time (s) | 33.5 | | | 12.3 | 96.5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 75 | | | 70 | 70 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|-----------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% ICU Level of Service A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
 88: Kingwood Dr. & Kingwood High School

PM Peak Hour



| Lane Group | SEL | SER | NEL | NET | SWT | SWR | ø6 | ø8 |
|----------------------------|-------|-------|-------|-------|------|-------|-------|------|
| Lane Configurations | ↔↔ | | ↔ | ↑↑ | | | | |
| Volume (vph) | 165 | 0 | 18 | 1818 | 0 | 0 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | | |
| Frt | | | | | | | | |
| Flt Protected | 0.950 | | 0.950 | | | | | |
| Satd. Flow (prot) | 3433 | 0 | 1770 | 3539 | 0 | 0 | | |
| Flt Permitted | 0.950 | | 0.950 | | | | | |
| Satd. Flow (perm) | 3433 | 0 | 1770 | 3539 | 0 | 0 | | |
| Right Turn on Red | | Yes | | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | | | |
| Link Speed (mph) | 30 | | | 30 | 30 | | | |
| Link Distance (ft) | 170 | | | 162 | 922 | | | |
| Travel Time (s) | 3.9 | | | 3.7 | 21.0 | | | |
| Peak Hour Factor | 0.79 | 0.92 | 0.56 | 0.90 | 0.92 | 0.92 | | |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | | |
| Adj. Flow (vph) | 236 | 0 | 36 | 2283 | 0 | 0 | | |
| Shared Lane Traffic (%) | | | | | | | | |
| Lane Group Flow (vph) | 236 | 0 | 36 | 2283 | 0 | 0 | | |
| Enter Blocked Intersection | No | No | No | No | No | No | | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | | |
| Median Width(ft) | 24 | | | 60 | 60 | | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | | |
| Two way Left Turn Lane | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 | | |
| Turn Type | NA | | Prot | NA | | | | |
| Protected Phases | 4 | | 15 | 2 | | | 6 | 8 |
| Permitted Phases | | | | | | | | |
| Minimum Split (s) | 10.0 | | 10.0 | 10.0 | | | 10.0 | 10.0 |
| Total Split (s) | 20.0 | | 12.0 | 107.0 | | | 107.0 | 11.0 |
| Total Split (%) | 13.3% | | 8.0% | 71.3% | | | 71% | 7% |
| Maximum Green (s) | 15.0 | | 6.0 | 101.0 | | | 101.0 | 6.0 |
| Yellow Time (s) | 4.0 | | 4.0 | 4.0 | | | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | | 2.0 | 2.0 | | | 2.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | | | | |
| Total Lost Time (s) | 5.0 | | 6.0 | 6.0 | | | | |
| Lead/Lag | Lead | | | | | | Lag | |
| Lead-Lag Optimize? | Yes | | | | | | Yes | |
| Act Effct Green (s) | 15.0 | | 6.0 | 101.0 | | | | |
| Actuated g/C Ratio | 0.10 | | 0.04 | 0.67 | | | | |
| v/c Ratio | 0.69 | | 0.51 | 0.96 | | | | |
| Control Delay | 21.8 | | 71.8 | 20.5 | | | | |
| Queue Delay | 0.0 | | 0.3 | 0.0 | | | | |
| Total Delay | 21.8 | | 72.2 | 20.5 | | | | |
| LOS | C | | E | C | | | | |
| Approach Delay | 21.8 | | | 21.3 | | | | |
| Approach LOS | C | | | C | | | | |

Alternative E: Direct Connector Kingwood to US 59
 88: Kingwood Dr. & Kingwood High School

PM Peak Hour

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:NET and 6:, Start of Green
 Natural Cycle: 100
 Control Type: Pretimed
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 21.3 Intersection LOS: C
 Intersection Capacity Utilization 71.3% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 88: Kingwood Dr. & Kingwood High School



Alternative E: Direct Connector Kingwood to US 59
 90: Kingwood Dr.

PM Peak Hour



| Lane Group | EBU | EBL | SBL | SBR | SWR |
|----------------------------|------|-------|------|-------|-------|
| Lane Configurations | | | | | |
| Volume (vph) | 0 | 1836 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 100 | 0 | 0 | 0 |
| Storage Lanes | | 1 | 0 | 0 | 0 |
| Taper Length (ft) | | 25 | 25 | | |
| Lane Util. Factor | 1.00 | 0.97 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | |
| Flt Protected | | 0.950 | | | |
| Satd. Flow (prot) | 1863 | 3433 | 0 | 0 | 0 |
| Flt Permitted | | 0.950 | | | |
| Satd. Flow (perm) | 1863 | 3433 | 0 | 0 | 0 |
| Link Speed (mph) | | 30 | 30 | | 30 |
| Link Distance (ft) | | 380 | 236 | | 162 |
| Travel Time (s) | | 8.6 | 5.4 | | 3.7 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 2255 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | |
| Lane Group Flow (vph) | 0 | 2255 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Right | Right |
| Median Width(ft) | | 36 | 0 | | 0 |
| Link Offset(ft) | | 0 | 0 | | 0 |
| Crosswalk Width(ft) | | 16 | 16 | | 16 |
| Two way Left Turn Lane | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | 15 | 15 | 9 | 9 |
| Sign Control | | Free | Stop | | Free |

Intersection Summary

| | |
|-----------------------------------|--------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 71.5% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 91: Lake Kingwood Trail & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|-------|-----|-----|-----|-----|-----|-------|-----|-----|------|-----|
| Detector Phase | 15 | 2 | | | | | | 8 | | 14 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 4.0 | | | | | | 5.0 | | | 5.0 | |
| Minimum Split (s) | 11.0 | 20.0 | | | | | | 18.0 | | | 10.0 | |
| Total Split (s) | 11.0 | 95.0 | | | | | | 19.0 | | | 11.0 | |
| Total Split (%) | 7.3% | 63.3% | | | | | | 12.7% | | | 7.3% | |
| Maximum Green (s) | 5.0 | 89.0 | | | | | | 14.0 | | | 6.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | | | | | 4.0 | | | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | | | | | 1.0 | | | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | | | | 5.0 | | | 5.0 | |
| Lead/Lag | | Lead | | | | | | Lag | | | Lead | |
| Lead-Lag Optimize? | | Yes | | | | | | Yes | | | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | | 3.0 | | | 3.0 | |
| Recall Mode | None | C-Max | | | | | | None | | | None | |
| Walk Time (s) | | 4.0 | | | | | | 6.0 | | | | |
| Flash Dont Walk (s) | | 10.0 | | | | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) | | 0 | | | | | | 0 | | | | |
| Act Effct Green (s) | 5.1 | 95.9 | | | | | | 13.7 | | | 20.0 | |
| Actuated g/C Ratio | 0.03 | 0.64 | | | | | | 0.09 | | | 0.13 | |
| v/c Ratio | 0.28 | 0.96 | | | | | | 0.86 | | | 0.17 | |
| Control Delay | 82.8 | 38.0 | | | | | | 81.5 | | | 26.4 | |
| Queue Delay | 0.0 | 0.0 | | | | | | 0.0 | | | 6.6 | |
| Total Delay | 82.8 | 38.0 | | | | | | 81.5 | | | 33.0 | |
| LOS | F | D | | | | | | F | | | C | |
| Approach Delay | | 38.4 | | | | | | 81.5 | | | 33.0 | |
| Approach LOS | | D | | | | | | F | | | C | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green |
| Natural Cycle: | 140 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.96 |
| Intersection Signal Delay: | 43.2 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 77.1% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

Splits and Phases: 91: Lake Kingwood Trail & Kingwood Dr.



| Lane Group | ø1 | ø6 |
|-------------------------|------|-------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 4.0 |
| Minimum Split (s) | 11.0 | 10.0 |
| Total Split (s) | 14.0 | 109.0 |
| Total Split (%) | 9% | 73% |
| Maximum Green (s) | 8.0 | 103.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | C-Max |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 96: Chestnut Ridge Dr. & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|------|------|-------|------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 90 | 687 | 88 | 0 | 0 | 0 | 0 | 89 | 161 | 97 | 116 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 0 | | 0 | 0 | | 150 | 0 | | 0 |
| Storage Lanes | 1 | | 0 | 0 | | 0 | 0 | | 1 | 1 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.983 | | | | | | | 0.850 | | | |
| Flt Protected | 0.950 | | | | | | | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3479 | 0 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Flt Permitted | 0.950 | | | | | | | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3479 | 0 | 0 | 0 | 0 | 0 | 1863 | 1583 | 1770 | 1863 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 16 | | | | | | | 242 | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 530 | | | 2489 | | | 973 | | | 98 | |
| Travel Time (s) | | 12.0 | | | 56.6 | | | 22.1 | | | 2.2 | |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% |
| Adj. Flow (vph) | 118 | 903 | 116 | 0 | 0 | 0 | 0 | 117 | 212 | 128 | 152 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 118 | 1019 | 0 | 0 | 0 | 0 | 0 | 117 | 212 | 128 | 152 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | | | | | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | | | | | | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | | | | | | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | | | | | | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | | | | | | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | | | | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | | | | | | NA | Perm | Prot | NA | |
| Protected Phases | 15 | 2 | | | | | | 8 | | 1 4 | 4 | |
| Permitted Phases | | | | | | | | | | 8 | | |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 96: Chestnut Ridge Dr. & Kingwood Dr.

PM Peak Hour

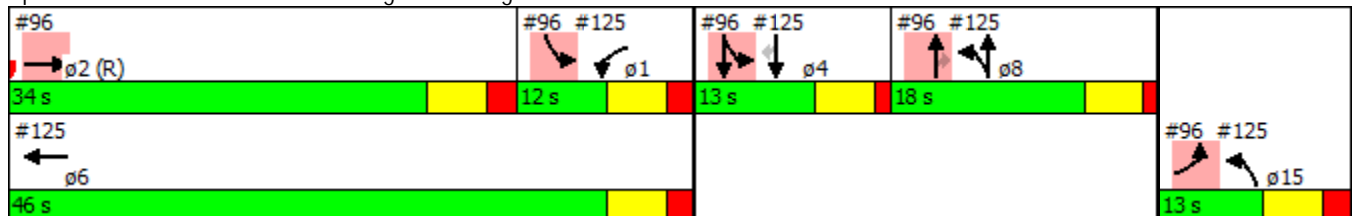


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-----|-----|-----|-----|-----|-------|-------|------|-------|-----|
| Detector Phase | 15 | 2 | | | | | | 8 | 8 | 14 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 4.0 | | | | | | 5.0 | 5.0 | | 5.0 | |
| Minimum Split (s) | 11.0 | 20.0 | | | | | | 18.0 | 18.0 | | 10.0 | |
| Total Split (s) | 13.0 | 34.0 | | | | | | 18.0 | 18.0 | | 13.0 | |
| Total Split (%) | 14.4% | 37.8% | | | | | | 20.0% | 20.0% | | 14.4% | |
| Maximum Green (s) | 7.0 | 28.0 | | | | | | 13.0 | 13.0 | | 8.0 | |
| Yellow Time (s) | 4.0 | 4.0 | | | | | | 4.0 | 4.0 | | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | | | | | | 1.0 | 1.0 | | 1.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | | | | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | 6.0 | 6.0 | | | | | | 5.0 | 5.0 | | 5.0 | |
| Lead/Lag | | Lead | | | | | | Lag | Lag | | Lead | |
| Lead-Lag Optimize? | | Yes | | | | | | Yes | Yes | | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | | 3.0 | 3.0 | | 3.0 | |
| Recall Mode | None | C-Max | | | | | | None | None | | None | |
| Walk Time (s) | | 4.0 | | | | | | 6.0 | 6.0 | | | |
| Flash Dont Walk (s) | | 10.0 | | | | | | 7.0 | 7.0 | | | |
| Pedestrian Calls (#/hr) | | 0 | | | | | | 0 | 0 | | | |
| Act Effct Green (s) | 7.8 | 28.8 | | | | | | 11.4 | 11.4 | 19.0 | 8.0 | |
| Actuated g/C Ratio | 0.09 | 0.32 | | | | | | 0.13 | 0.13 | 0.21 | 0.09 | |
| v/c Ratio | 0.77 | 0.91 | | | | | | 0.50 | 0.52 | 0.34 | 0.92 | |
| Control Delay | 73.5 | 42.4 | | | | | | 43.6 | 8.1 | 16.0 | 48.9 | |
| Queue Delay | 47.9 | 0.0 | | | | | | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 121.4 | 42.4 | | | | | | 43.6 | 8.1 | 16.0 | 48.9 | |
| LOS | F | D | | | | | | D | A | B | D | |
| Approach Delay | | 50.6 | | | | | | 20.7 | | | 33.8 | |
| Approach LOS | | D | | | | | | C | | | C | |

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 42.2
 Intersection LOS: D
 Intersection Capacity Utilization 97.5%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 96: Chestnut Ridge Dr. & Kingwood Dr.



| Lane Group | ø1 | ø6 |
|-------------------------|------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 4.0 |
| Minimum Split (s) | 11.0 | 10.0 |
| Total Split (s) | 12.0 | 46.0 |
| Total Split (%) | 13% | 51% |
| Maximum Green (s) | 6.0 | 40.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | None |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
98: Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| Lane Configurations | | | | | ↑↑ | | ↑ | ↑ | | | ↑ | ↑ |
| Volume (vph) | 0 | 0 | 0 | 68 | 1205 | 22 | 250 | 18 | 0 | 0 | 30 | 24 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | 0.997 | | | | | | | 0.850 |
| Flt Protected | | | | | 0.997 | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3518 | 0 | 1770 | 1863 | 0 | 0 | 1863 | 1583 |
| Flt Permitted | | | | | 0.997 | | 0.733 | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3518 | 0 | 1365 | 1863 | 0 | 0 | 1863 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 4 | | | | | | | 29 |
| Link Speed (mph) | | 45 | | | 45 | | | 30 | | | 30 | |
| Link Distance (ft) | | 1996 | | | 1249 | | | 106 | | | 273 | |
| Travel Time (s) | | 30.2 | | | 18.9 | | | 2.4 | | | 6.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 84 | 1480 | 27 | 307 | 22 | 0 | 0 | 37 | 29 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 1591 | 0 | 307 | 22 | 0 | 0 | 37 | 29 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | | | | 1 | 2 | | 1 | 2 | | | 2 | 1 |
| Detector Template | | | | Left | Thru | | Left | Thru | | | Thru | Right |
| Leading Detector (ft) | | | | 20 | 100 | | 20 | 100 | | | 100 | 20 |
| Trailing Detector (ft) | | | | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| Detector 1 Position(ft) | | | | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| Detector 1 Size(ft) | | | | 20 | 6 | | 20 | 6 | | | 6 | 20 |
| Detector 1 Type | | | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | 0.0 |
| Detector 1 Queue (s) | | | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | 0.0 |
| Detector 1 Delay (s) | | | | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | 0.0 |
| Detector 2 Position(ft) | | | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | | | | Perm | NA | | Perm | NA | | | NA | Perm |
| Protected Phases | | | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | | | | 8 | | | 2 | | | | | 6 |
| Detector Phase | | | | 8 | 8 | | 2 | 2 | | | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | 4.0 | 4.0 | | 4.0 | 4.0 | | | 4.0 | 4.0 |

| Lane Group | ø4 |
|----------------------------|-----|
| Lane Configurations | |
| Volume (vph) | |
| Ideal Flow (vphpl) | |
| Lane Util. Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Growth Factor | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 4 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 4.0 |

Alternative E: Direct Connector Kingwood to US 59
98: Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-----|-----|-------|-------|-----|-------|-------|-----|-----|-------|-------|
| Minimum Split (s) | | | | 20.0 | 20.0 | | 20.0 | 20.0 | | | 20.0 | 20.0 |
| Total Split (s) | | | | 65.0 | 65.0 | | 25.0 | 25.0 | | | 25.0 | 25.0 |
| Total Split (%) | | | | 72.2% | 72.2% | | 27.8% | 27.8% | | | 27.8% | 27.8% |
| Maximum Green (s) | | | | 61.0 | 61.0 | | 21.0 | 21.0 | | | 21.0 | 21.0 |
| Yellow Time (s) | | | | 3.5 | 3.5 | | 3.5 | 3.5 | | | 3.5 | 3.5 |
| All-Red Time (s) | | | | 0.5 | 0.5 | | 0.5 | 0.5 | | | 0.5 | 0.5 |
| Lost Time Adjust (s) | | | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | 0.0 |
| Total Lost Time (s) | | | | | 4.0 | | 4.0 | 4.0 | | | 4.0 | 4.0 |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | | 3.0 | 3.0 | | | 3.0 | 3.0 |
| Recall Mode | | | | None | None | | C-Max | C-Max | | | C-Max | C-Max |
| Walk Time (s) | | | | 5.0 | 5.0 | | 5.0 | 5.0 | | | 5.0 | 5.0 |
| Flash Dont Walk (s) | | | | 11.0 | 11.0 | | 11.0 | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | | | 0 | 0 | | 0 | 0 | | | 0 | 0 |
| Act Effect Green (s) | | | | | 61.0 | | 21.0 | 21.0 | | | 21.0 | 21.0 |
| Actuated g/C Ratio | | | | | 0.68 | | 0.23 | 0.23 | | | 0.23 | 0.23 |
| v/c Ratio | | | | | 0.67 | | 0.97 | 0.05 | | | 0.09 | 0.07 |
| Control Delay | | | | | 10.2 | | 75.5 | 23.4 | | | 27.7 | 10.9 |
| Queue Delay | | | | | 9.9 | | 46.4 | 7.3 | | | 0.0 | 0.0 |
| Total Delay | | | | | 20.1 | | 121.9 | 30.8 | | | 27.7 | 10.9 |
| LOS | | | | | C | | F | C | | | C | B |
| Approach Delay | | | | | 20.1 | | | 115.8 | | | 20.3 | |
| Approach LOS | | | | | C | | | F | | | C | |

Intersection Summary

| | |
|------------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 90 |
| Actuated Cycle Length: | 90 |
| Offset: | 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green |
| Natural Cycle: | 80 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.97 |
| Intersection Signal Delay: | 36.0 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 113.1% |
| ICU Level of Service: | H |
| Analysis Period (min): | 15 |

Splits and Phases: 98: Northpark Dr.



| | |
|-------------------------|------|
| Lane Group | ø4 |
| Minimum Split (s) | 20.0 |
| Total Split (s) | 65.0 |
| Total Split (%) | 72% |
| Maximum Green (s) | 61.0 |
| Yellow Time (s) | 3.5 |
| All-Red Time (s) | 0.5 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Walk Time (s) | 5.0 |
| Flash Dont Walk (s) | 11.0 |
| Pedestrian Calls (#/hr) | 0 |
| Act Effect Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Intersection Summary | |

Alternative E: Direct Connector Kingwood to US 59
102: Kingwood Dr.

PM Peak Hour



| Lane Group | WBL | WBR | NET | NER | SWL | SWT |
|----------------------------|-------|-------|------|-------|------|------|
| Lane Configurations | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 1863 | 0 | 0 | 0 | 0 | 3539 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 1863 | 0 | 0 | 0 | 0 | 3539 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 236 | | 360 | | | 156 |
| Travel Time (s) | 5.4 | | 8.2 | | | 3.5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Yield | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 71.5% |
| Analysis Period (min) | 15 |
| | ICU Level of Service C |

Alternative E: Direct Connector Kingwood to US 59
 104: US 59 SBFR & Kingwood Dr.

PM Peak Hour

| Lane Group | ø1 | ø3 | ø4 | ø5 | ø6 | ø7 | ø8 | ø11 | ø15 | ø16 | ø21 |
|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lane Configurations | | | | | | | | | | | |
| Volume (vph) | | | | | | | | | | | |
| Ideal Flow (vphpl) | | | | | | | | | | | |
| Lane Util. Factor | | | | | | | | | | | |
| Frt | | | | | | | | | | | |
| Flt Protected | | | | | | | | | | | |
| Satd. Flow (prot) | | | | | | | | | | | |
| Flt Permitted | | | | | | | | | | | |
| Satd. Flow (perm) | | | | | | | | | | | |
| Right Turn on Red | | | | | | | | | | | |
| Satd. Flow (RTOR) | | | | | | | | | | | |
| Link Speed (mph) | | | | | | | | | | | |
| Link Distance (ft) | | | | | | | | | | | |
| Travel Time (s) | | | | | | | | | | | |
| Peak Hour Factor | | | | | | | | | | | |
| Growth Factor | | | | | | | | | | | |
| Adj. Flow (vph) | | | | | | | | | | | |
| Shared Lane Traffic (%) | | | | | | | | | | | |
| Lane Group Flow (vph) | | | | | | | | | | | |
| Enter Blocked Intersection | | | | | | | | | | | |
| Lane Alignment | | | | | | | | | | | |
| Median Width(ft) | | | | | | | | | | | |
| Link Offset(ft) | | | | | | | | | | | |
| Crosswalk Width(ft) | | | | | | | | | | | |
| Two way Left Turn Lane | | | | | | | | | | | |
| Headway Factor | | | | | | | | | | | |
| Turning Speed (mph) | | | | | | | | | | | |
| Number of Detectors | | | | | | | | | | | |
| Detector Template | | | | | | | | | | | |
| Leading Detector (ft) | | | | | | | | | | | |
| Trailing Detector (ft) | | | | | | | | | | | |
| Detector 1 Position(ft) | | | | | | | | | | | |
| Detector 1 Size(ft) | | | | | | | | | | | |
| Detector 1 Type | | | | | | | | | | | |
| Detector 1 Channel | | | | | | | | | | | |
| Detector 1 Extend (s) | | | | | | | | | | | |
| Detector 1 Queue (s) | | | | | | | | | | | |
| Detector 1 Delay (s) | | | | | | | | | | | |
| Detector 2 Position(ft) | | | | | | | | | | | |
| Detector 2 Size(ft) | | | | | | | | | | | |
| Detector 2 Type | | | | | | | | | | | |
| Detector 2 Channel | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | | | | | | | | |
| Turn Type | | | | | | | | | | | |
| Protected Phases | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 11 | 15 | 16 | 21 |
| Permitted Phases | | | | | | | | | | | |
| Detector Phase | | | | | | | | | | | |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 1.0 | 5.0 | 3.0 | 8.0 | 1.0 | 1.0 | 3.0 | 3.0 | 4.0 | 1.0 |

Alternative E: Direct Connector Kingwood to US 59
 104: US 59 SBFR & Kingwood Dr.

PM Peak Hour

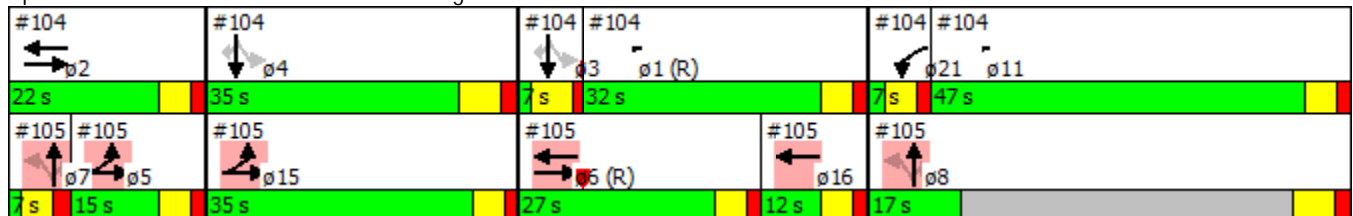


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|--------|-----|-----|-------|-----|-----|-----|-----|------|------|------|
| Minimum Split (s) | | 12.3 | | | | | | | | | | |
| Total Split (s) | | 22.0 | | | | | | | | | | |
| Total Split (%) | | 14.7% | | | | | | | | | | |
| Maximum Green (s) | | 16.7 | | | | | | | | | | |
| Yellow Time (s) | | 3.6 | | | | | | | | | | |
| All-Red Time (s) | | 1.7 | | | | | | | | | | |
| Lost Time Adjust (s) | | 0.0 | | | | | | | | | | |
| Total Lost Time (s) | | 5.3 | | | | | | | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | | 3.0 | | | | | | | | | | |
| Recall Mode | | Max | | | | | | | | | | |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effect Green (s) | | 16.7 | | | 107.6 | | | | | 31.4 | 31.4 | 31.4 |
| Actuated g/C Ratio | | 0.11 | | | 0.72 | | | | | 0.21 | 0.21 | 0.21 |
| v/c Ratio | | 1.17dr | | | 0.30 | | | | | 0.38 | 0.40 | 0.24 |
| Control Delay | | 118.1 | | | 1.4 | | | | | 43.6 | 40.8 | 1.4 |
| Queue Delay | | 0.0 | | | 0.3 | | | | | 0.0 | 0.0 | 0.0 |
| Total Delay | | 118.1 | | | 1.7 | | | | | 43.6 | 40.8 | 1.4 |
| LOS | | F | | | A | | | | | D | D | A |
| Approach Delay | | 118.1 | | | 1.7 | | | | | | 34.2 | |
| Approach LOS | | F | | | A | | | | | | C | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 8 (5%), Referenced to phase 1:WBTL and 6:, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 54.0 Intersection LOS: D
 Intersection Capacity Utilization 73.5% ICU Level of Service D
 Analysis Period (min) 15
 dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 104: US 59 SBFR & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
 104: US 59 SBFR & Kingwood Dr.

PM Peak Hour

| Lane Group | ø1 | ø3 | ø4 | ø5 | ø6 | ø7 | ø8 | ø11 | ø15 | ø16 | ø21 |
|-------------------------|-------|------|------|------|-------|------|------|------|------|------|------|
| Minimum Split (s) | 8.3 | 6.7 | 11.7 | 8.3 | 25.3 | 6.7 | 26.7 | 8.3 | 8.3 | 9.3 | 6.3 |
| Total Split (s) | 32.0 | 7.0 | 35.0 | 15.0 | 27.0 | 7.0 | 17.0 | 47.0 | 35.0 | 12.0 | 7.0 |
| Total Split (%) | 21% | 5% | 23% | 10% | 18% | 5% | 11% | 31% | 23% | 8% | 5% |
| Maximum Green (s) | 26.7 | 1.3 | 28.3 | 9.7 | 21.7 | 1.3 | 10.3 | 41.7 | 29.7 | 6.7 | 1.7 |
| Yellow Time (s) | 3.6 | 4.7 | 4.7 | 3.6 | 3.6 | 3.7 | 4.7 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.7 | 1.0 | 2.0 | 1.7 | 1.7 | 2.0 | 2.0 | 1.7 | 1.7 | 1.7 | 1.7 |
| Lost Time Adjust (s) | | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | | |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | | Lag | | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | C-Max | None | None | None | C-Max | Max | None | None | None | None | None |
| Walk Time (s) | | | | | 5.0 | | 6.0 | | | | |
| Flash Dont Walk (s) | | | | | 15.0 | | 14.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | 0 | | 0 | | | | |
| Act Effct Green (s) | | | | | | | | | | | |
| Actuated g/C Ratio | | | | | | | | | | | |
| v/c Ratio | | | | | | | | | | | |
| Control Delay | | | | | | | | | | | |
| Queue Delay | | | | | | | | | | | |
| Total Delay | | | | | | | | | | | |
| LOS | | | | | | | | | | | |
| Approach Delay | | | | | | | | | | | |
| Approach LOS | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 105: US 59 NBFR & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|--------|-------|------|-------|-------|-------|-------|-------|------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 222 | 321 | 0 | 0 | 211 | 341 | 412 | 592 | 982 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 0 | | 600 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 2 | | 0 | 0 | | 2 | 1 | | 2 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 1.00 | 0.86 | 0.86 | 0.86 | 0.86 | 0.88 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | 0.904 | | | | 0.850 | | | |
| Flt Protected | 0.950 | | | | | | 0.950 | 0.989 | | | | |
| Satd. Flow (prot) | 3433 | 3539 | 0 | 0 | 5793 | 0 | 1522 | 4753 | 2787 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | 0.950 | 0.989 | | | | |
| Satd. Flow (perm) | 3433 | 3539 | 0 | 0 | 5793 | 0 | 1522 | 4753 | 2787 | 0 | 0 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 161 | | | | 749 | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 256 | | | 1514 | | | 180 | | | 217 | |
| Travel Time (s) | | 5.8 | | | 34.4 | | | 4.1 | | | 4.9 | |
| Peak Hour Factor | 0.78 | 0.85 | 0.92 | 0.92 | 0.95 | 0.86 | 0.85 | 0.87 | 0.89 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 322 | 427 | 0 | 0 | 251 | 448 | 548 | 769 | 1247 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | 42% | | | | | |
| Lane Group Flow (vph) | 322 | 427 | 0 | 0 | 699 | 0 | 318 | 999 | 1247 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | | | 2 | | 1 | 2 | 1 | | | |
| Detector Template | Left | Thru | | | Thru | | Left | Thru | Right | | | |
| Leading Detector (ft) | 20 | 100 | | | 100 | | 20 | 100 | 20 | | | |
| Trailing Detector (ft) | 0 | 0 | | | 0 | | 0 | 0 | 0 | | | |
| Detector 1 Position(ft) | 0 | 0 | | | 0 | | 0 | 0 | 0 | | | |
| Detector 1 Size(ft) | 20 | 6 | | | 6 | | 20 | 6 | 20 | | | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | | | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | |
| Turn Type | Prot | NA | | | NA | | Perm | NA | Perm | | | |
| Protected Phases | 5 15 | 5 6 15 | | | 6 16 | | | 7 8 | | | | |
| Permitted Phases | | | | | | | 7 8 | | 7 8 | | | |

Alternative E: Direct Connector Kingwood to US 59
 105: US 59 NBFR & Kingwood Dr.

PM Peak Hour

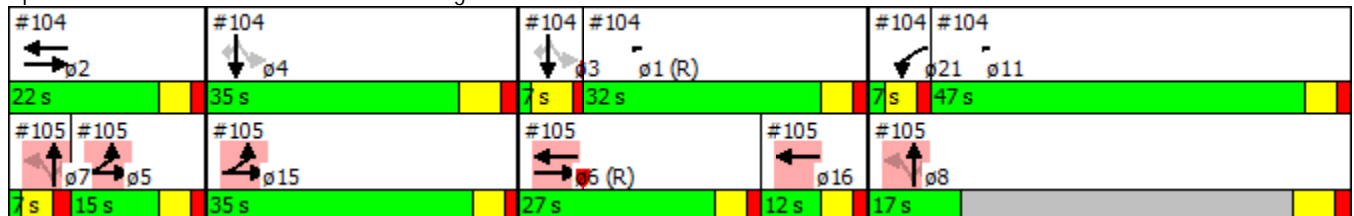


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|------|--------|-----|-----|------|-----|------|------|------|-----|-----|-----|
| Detector Phase | 5 15 | 5 6 15 | | | 6 16 | | 7 8 | 7 8 | 7 8 | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | | | | | | | | | |
| Minimum Split (s) | | | | | | | | | | | | |
| Total Split (s) | | | | | | | | | | | | |
| Total Split (%) | | | | | | | | | | | | |
| Maximum Green (s) | | | | | | | | | | | | |
| Yellow Time (s) | | | | | | | | | | | | |
| All-Red Time (s) | | | | | | | | | | | | |
| Lost Time Adjust (s) | | | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | | | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | | | | | | | | | | | | |
| Recall Mode | | | | | | | | | | | | |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effct Green (s) | 34.6 | 71.7 | | | 43.8 | | 55.3 | 55.3 | 55.3 | | | |
| Actuated g/C Ratio | 0.23 | 0.48 | | | 0.29 | | 0.37 | 0.37 | 0.37 | | | |
| v/c Ratio | 0.41 | 0.25 | | | 0.39 | | 0.57 | 0.57 | 0.83 | | | |
| Control Delay | 8.2 | 2.0 | | | 11.9 | | 42.6 | 39.4 | 21.9 | | | |
| Queue Delay | 0.6 | 1.9 | | | 0.0 | | 0.0 | 0.0 | 0.0 | | | |
| Total Delay | 8.8 | 3.9 | | | 11.9 | | 42.6 | 39.4 | 21.9 | | | |
| LOS | A | A | | | B | | D | D | C | | | |
| Approach Delay | | 6.0 | | | 11.9 | | | 31.3 | | | | |
| Approach LOS | | A | | | B | | | C | | | | |

Intersection Summary

| | |
|-----------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 8 (5%), Referenced to phase 1:WBTL and 6:, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.10 |
| Intersection Signal Delay: | 23.2 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 73.5% |
| ICU Level of Service | D |
| Analysis Period (min) | 15 |

Splits and Phases: 105: US 59 NBFR & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
 105: US 59 NBFR & Kingwood Dr.

PM Peak Hour

| Lane Group | ø1 | ø2 | ø3 | ø4 | ø5 | ø6 | ø7 | ø8 | ø11 | ø15 | ø16 | ø21 | | | | |
|-------------------------|-------|------|------|------|------|-------|------|------|------|------|------|------|------|--|------|--|
| Detector Phase | | | | | | | | | | | | | | | | |
| Switch Phase | | | | | | | | | | | | | | | | |
| Minimum Initial (s) | 3.0 | 7.0 | 1.0 | 5.0 | 3.0 | 8.0 | 1.0 | 1.0 | 3.0 | 3.0 | 4.0 | 1.0 | | | | |
| Minimum Split (s) | 8.3 | 12.3 | 6.7 | 11.7 | 8.3 | 25.3 | 6.7 | 26.7 | 8.3 | 8.3 | 9.3 | 6.3 | | | | |
| Total Split (s) | 32.0 | 22.0 | 7.0 | 35.0 | 15.0 | 27.0 | 7.0 | 17.0 | 47.0 | 35.0 | 12.0 | 7.0 | | | | |
| Total Split (%) | 21% | 15% | 5% | 23% | 10% | 18% | 5% | 11% | 31% | 23% | 8% | 5% | | | | |
| Maximum Green (s) | 26.7 | 16.7 | 1.3 | 28.3 | 9.7 | 21.7 | 1.3 | 10.3 | 41.7 | 29.7 | 6.7 | 1.7 | | | | |
| Yellow Time (s) | 3.6 | 3.6 | 4.7 | 4.7 | 3.6 | 3.6 | 3.7 | 4.7 | 3.6 | 3.6 | 3.6 | 3.6 | | | | |
| All-Red Time (s) | 1.7 | 1.7 | 1.0 | 2.0 | 1.7 | 1.7 | 2.0 | 2.0 | 1.7 | 1.7 | 1.7 | 1.7 | | | | |
| Lost Time Adjust (s) | | | | | | | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | | | | | | | |
| Lead/Lag | Lag | | Lead | | Lag | | Lead | | Lead | | Lag | | Lag | | Lead | |
| Lead-Lag Optimize? | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | | |
| Recall Mode | C-Max | Max | None | None | None | C-Max | Max | None | None | None | None | None | | | | |
| Walk Time (s) | | | | | | | 5.0 | | | | | | 6.0 | | | |
| Flash Dont Walk (s) | | | | | | | 15.0 | | | | | | 14.0 | | | |
| Pedestrian Calls (#/hr) | | | | | | | 0 | | | | | | 0 | | | |
| Act Effect Green (s) | | | | | | | | | | | | | | | | |
| Actuated g/C Ratio | | | | | | | | | | | | | | | | |
| v/c Ratio | | | | | | | | | | | | | | | | |
| Control Delay | | | | | | | | | | | | | | | | |
| Queue Delay | | | | | | | | | | | | | | | | |
| Total Delay | | | | | | | | | | | | | | | | |
| LOS | | | | | | | | | | | | | | | | |
| Approach Delay | | | | | | | | | | | | | | | | |
| Approach LOS | | | | | | | | | | | | | | | | |
| Intersection Summary | | | | | | | | | | | | | | | | |

Alternative E: Direct Connector Kingwood to US 59
107: Kingwood Dr.

PM Peak Hour



| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|-------|-------|------|-------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 5 | 196 | 289 | 375 | 70 | 81 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | 0 | | 150 | 0 | |
| Storage Lanes | 1 | 1 | | 1 | 0 | |
| Taper Length (ft) | 25 | | | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.850 | | 0.850 | | |
| Flt Protected | 0.950 | | | | | 0.978 |
| Satd. Flow (prot) | 1770 | 1583 | 1863 | 1583 | 0 | 1822 |
| Flt Permitted | 0.950 | | | | | 0.978 |
| Satd. Flow (perm) | 1770 | 1583 | 1863 | 1583 | 0 | 1822 |
| Link Speed (mph) | 40 | | 35 | | | 35 |
| Link Distance (ft) | 2029 | | 3577 | | | 5784 |
| Travel Time (s) | 34.6 | | 69.7 | | | 112.7 |
| Peak Hour Factor | 0.63 | 0.77 | 0.79 | 0.66 | 0.92 | 0.84 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 9 | 288 | 413 | 642 | 86 | 109 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 9 | 288 | 413 | 642 | 0 | 195 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Stop | | Stop | | | Stop |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 42.1% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 111: Lake Houston Parkway & Rustic Woods

PM Peak Hour

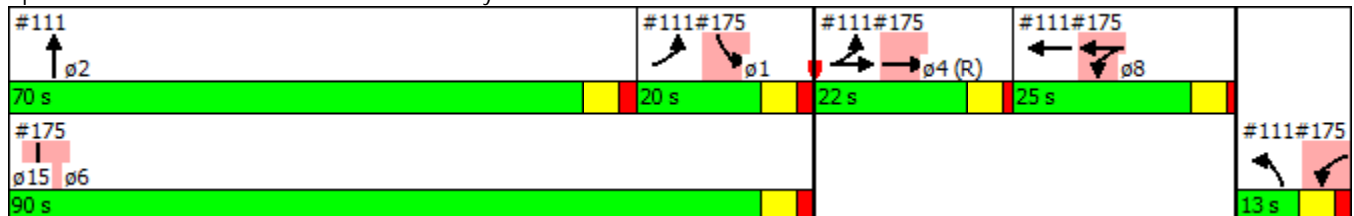


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-------|-----|-----|-------|-----|-------|-------|-----|-----|-----|-----|
| Detector Phase | 1 4 | 4 | | | 8 | | 15 | 2 | | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | 5.0 | | | 5.0 | | 5.0 | 4.0 | | | | |
| Minimum Split (s) | | 21.0 | | | 25.0 | | 11.0 | 21.0 | | | | |
| Total Split (s) | | 22.0 | | | 25.0 | | 13.0 | 70.0 | | | | |
| Total Split (%) | | 14.7% | | | 16.7% | | 8.7% | 46.7% | | | | |
| Maximum Green (s) | | 17.0 | | | 20.0 | | 7.0 | 64.0 | | | | |
| Yellow Time (s) | | 4.0 | | | 4.0 | | 4.0 | 4.0 | | | | |
| All-Red Time (s) | | 1.0 | | | 1.0 | | 2.0 | 2.0 | | | | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | 6.0 | 6.0 | | | | |
| Lead/Lag | | Lead | | | Lag | | | Lead | | | | |
| Lead-Lag Optimize? | | Yes | | | Yes | | | Yes | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | | | |
| Recall Mode | | C-Max | | | None | | None | Max | | | | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | 5.0 | | | | |
| Flash Dont Walk (s) | | 11.0 | | | 14.0 | | | 6.0 | | | | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | | |
| Act Effct Green (s) | | 33.0 | | | 16.1 | | 10.9 | 68.0 | | | | |
| Actuated g/C Ratio | | 0.22 | | | 0.11 | | 0.07 | 0.45 | | | | |
| v/c Ratio | | 0.23 | | | 0.59 | | 1.02 | 1.02 | | | | |
| Control Delay | | 19.6 | | | 42.6 | | 148.9 | 69.1 | | | | |
| Queue Delay | | 8.9 | | | 0.4 | | 2.3 | 0.0 | | | | |
| Total Delay | | 28.6 | | | 43.0 | | 151.2 | 69.1 | | | | |
| LOS | | C | | | D | | F | E | | | | |
| Approach Delay | | 28.6 | | | 43.0 | | | 75.2 | | | | |
| Approach LOS | | C | | | D | | | E | | | | |

Intersection Summary

| | |
|------------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 20 (13%), Referenced to phase 4:EBTL, Start of Green |
| Natural Cycle: | 150 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.02 |
| Intersection Signal Delay: | 67.6 |
| Intersection LOS: | E |
| Intersection Capacity Utilization: | 67.4% |
| ICU Level of Service: | C |
| Analysis Period (min): | 15 |

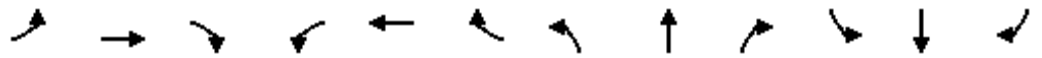
Splits and Phases: 111: Lake Houston Parkway & Rustic Woods



| Lane Group | ø1 | ø6 |
|-------------------------|------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 4.0 |
| Minimum Split (s) | 20.0 | 21.0 |
| Total Split (s) | 20.0 | 90.0 |
| Total Split (%) | 13% | 60% |
| Maximum Green (s) | 14.0 | 84.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | Max |
| Walk Time (s) | | |
| Flash Dont Walk (s) | | |
| Pedestrian Calls (#/hr) | | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 115: Loop 494 & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 15 | 1353 | 20 | 114 | 949 | 136 | 35 | 203 | 470 | 174 | 120 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 150 | 150 | | 0 | 150 | | 150 | 160 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.850 | | 0.981 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3472 | 0 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3472 | 0 | 1770 | 1863 | 1583 | 1770 | 1863 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 105 | | 14 | | | | 225 | | | 149 |
| Link Speed (mph) | | 40 | | | 40 | | | 45 | | | | 45 |
| Link Distance (ft) | | 1514 | | | 523 | | | 675 | | | | 922 |
| Travel Time (s) | | 25.8 | | | 8.9 | | | 10.2 | | | | 14.0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% |
| Adj. Flow (vph) | 19 | 1721 | 25 | 145 | 1207 | 173 | 45 | 258 | 598 | 221 | 153 | 95 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 19 | 1721 | 25 | 145 | 1380 | 0 | 45 | 258 | 598 | 221 | 153 | 95 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 30 | | | 30 | | | 20 | | | | 20 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | 1 |
| Detector Template | Left | Thru | Right | Left | Thru | | Left | Thru | Right | Left | Thru | Right |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | 20 |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | 20 |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 1 | 6 | | 5 | 2 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | | | 6 | | | | | | 4 | | | 8 |

Alternative E: Direct Connector Kingwood to US 59
115: Loop 494 & Kingwood Dr.

PM Peak Hour

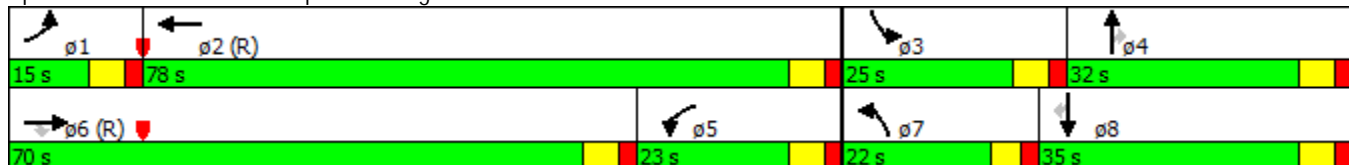


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| Detector Phase | 1 | 6 | 6 | 5 | 2 | | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 11.0 | 22.0 | 22.0 | 11.0 | 22.0 | | 10.5 | 14.0 | 14.0 | 11.0 | 22.0 | 22.0 |
| Total Split (s) | 15.0 | 70.0 | 70.0 | 23.0 | 78.0 | | 22.0 | 32.0 | 32.0 | 25.0 | 35.0 | 35.0 |
| Total Split (%) | 10.0% | 46.7% | 46.7% | 15.3% | 52.0% | | 14.7% | 21.3% | 21.3% | 16.7% | 23.3% | 23.3% |
| Maximum Green (s) | 9.0 | 64.0 | 64.0 | 17.0 | 72.0 | | 16.5 | 26.0 | 26.0 | 19.0 | 29.0 | 29.0 |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 3.5 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | | 5.5 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lead | Lead | Lag | Lag | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | C-Max | C-Max | None | C-Max | | None | None | None | None | None | None |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | | | 5.0 | 5.0 | | 5.0 | 5.0 |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | 0 | | 0 | | | 0 | 0 | | 0 | 0 |
| Act Effect Green (s) | 7.1 | 64.0 | 64.0 | 17.0 | 78.6 | | 9.2 | 26.0 | 26.0 | 19.0 | 38.5 | 38.5 |
| Actuated g/C Ratio | 0.05 | 0.43 | 0.43 | 0.11 | 0.52 | | 0.06 | 0.17 | 0.17 | 0.13 | 0.26 | 0.26 |
| v/c Ratio | 0.23 | 1.14 | 0.03 | 0.72 | 0.76 | | 0.42 | 0.80 | 1.30 | 0.99 | 0.32 | 0.18 |
| Control Delay | 82.4 | 102.6 | 0.1 | 84.9 | 32.3 | | 78.4 | 78.4 | 179.6 | 67.2 | 54.9 | 18.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 28.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 82.4 | 102.6 | 0.1 | 84.9 | 60.4 | | 78.4 | 78.4 | 179.6 | 67.2 | 54.9 | 18.5 |
| LOS | F | F | A | F | E | | E | E | F | E | D | B |
| Approach Delay | | 100.9 | | | 62.7 | | | 145.6 | | | 53.3 | |
| Approach LOS | | F | | | E | | | F | | | D | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 90 (60%), Referenced to phase 2:WBT and 6:EBT, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 92.3
 Intersection LOS: F
 Intersection Capacity Utilization 104.1%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 115: Loop 494 & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
 118: Royal Forest /Royal Forest & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 38 | 1753 | 206 | 91 | 1113 | 12 | 168 | 26 | 84 | 10 | 13 | 107 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 150 | 150 | | 0 | 0 | | 150 | 0 | | 0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 0 | | 1 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 |
| Frt | | | 0.850 | | 0.998 | | | | 0.850 | | 0.877 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.958 | | | 0.996 | |
| Satd. Flow (prot) | 1770 | 3539 | 1583 | 1770 | 3532 | 0 | 0 | 1785 | 1583 | 0 | 3091 | 0 |
| Flt Permitted | 0.950 | | | 0.950 | | | | 0.638 | | | 0.748 | |
| Satd. Flow (perm) | 1770 | 3539 | 1583 | 1770 | 3532 | 0 | 0 | 1188 | 1583 | 0 | 2322 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 120 | | 1 | | | | 131 | | 136 | |
| Link Speed (mph) | | 40 | | | 40 | | | 30 | | | 30 | |
| Link Distance (ft) | | 523 | | | 284 | | | 392 | | | 750 | |
| Travel Time (s) | | 8.9 | | | 4.8 | | | 8.9 | | | 17.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% |
| Adj. Flow (vph) | 48 | 2229 | 262 | 116 | 1415 | 15 | 214 | 33 | 107 | 13 | 17 | 136 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 48 | 2229 | 262 | 116 | 1430 | 0 | 0 | 247 | 107 | 0 | 166 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 30 | | | 30 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | 1 | 2 | 1 | 1 | 2 | | 1 | 2 | 1 | 1 | 2 | |
| Detector Template | Left | Thru | Right | Left | Thru | | Left | Thru | Right | Left | Thru | |
| Leading Detector (ft) | 20 | 100 | 20 | 20 | 100 | | 20 | 100 | 20 | 20 | 100 | |
| Trailing Detector (ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Position(ft) | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | |
| Detector 1 Size(ft) | 20 | 6 | 20 | 20 | 6 | | 20 | 6 | 20 | 20 | 6 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Detector 2 Position(ft) | | 94 | | | 94 | | | 94 | | | 94 | |
| Detector 2 Size(ft) | | 6 | | | 6 | | | 6 | | | 6 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Prot | NA | Perm | Prot | NA | | Perm | NA | Perm | Perm | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | | 8 | | | 4 | |
| Permitted Phases | | | 2 | | | | 8 | | 8 | 4 | | |

Alternative E: Direct Connector Kingwood to US 59
 118: Royal Forest /Royal Forest & Kingwood Dr.

PM Peak Hour

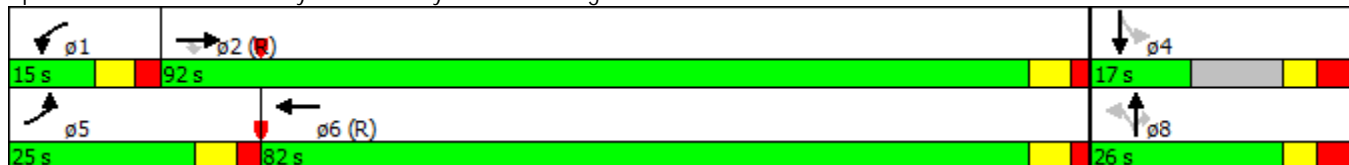


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-----|
| Detector Phase | 5 | 2 | 2 | 1 | 6 | | 8 | 8 | 8 | 4 | 4 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 8.0 | 8.0 | 4.0 | 8.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | |
| Minimum Split (s) | 22.5 | 22.0 | 22.0 | 10.5 | 22.0 | | 23.0 | 23.0 | 23.0 | 13.0 | 13.0 | |
| Total Split (s) | 25.0 | 92.0 | 92.0 | 15.0 | 82.0 | | 26.0 | 26.0 | 26.0 | 17.0 | 17.0 | |
| Total Split (%) | 18.8% | 69.2% | 69.2% | 11.3% | 61.7% | | 19.5% | 19.5% | 19.5% | 12.8% | 12.8% | |
| Maximum Green (s) | 18.5 | 86.0 | 86.0 | 8.5 | 76.0 | | 19.0 | 19.0 | 19.0 | 10.0 | 10.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | |
| All-Red Time (s) | 2.5 | 2.0 | 2.0 | 2.5 | 2.0 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | 6.5 | 6.0 | 6.0 | 6.5 | 6.0 | | | 7.0 | 7.0 | | 7.0 | |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | C-Max | C-Max | None | C-Max | | None | None | None | None | None | |
| Walk Time (s) | | 5.0 | 5.0 | | 5.0 | | 5.0 | 5.0 | 5.0 | | | |
| Flash Dont Walk (s) | | 11.0 | 11.0 | | 11.0 | | 11.0 | 11.0 | 11.0 | | | |
| Pedestrian Calls (#/hr) | | 0 | 0 | | 0 | | 0 | 0 | 0 | | | |
| Act Effect Green (s) | 9.0 | 86.0 | 86.0 | 8.5 | 87.9 | | | 19.0 | 19.0 | | 19.0 | |
| Actuated g/C Ratio | 0.07 | 0.65 | 0.65 | 0.06 | 0.66 | | | 0.14 | 0.14 | | 0.14 | |
| v/c Ratio | 0.40 | 0.97 | 0.25 | 1.03 | 0.61 | | | 1.46 | 0.32 | | 0.37 | |
| Control Delay | 68.4 | 36.5 | 5.7 | 151.8 | 15.1 | | | 276.8 | 7.1 | | 15.3 | |
| Queue Delay | 0.0 | 42.1 | 0.0 | 0.0 | 0.0 | | | 0.0 | 0.0 | | 0.0 | |
| Total Delay | 68.4 | 78.6 | 5.7 | 151.8 | 15.1 | | | 276.8 | 7.1 | | 15.3 | |
| LOS | E | E | A | F | B | | | F | A | | B | |
| Approach Delay | | 70.9 | | | 25.4 | | | 195.3 | | | 15.3 | |
| Approach LOS | | E | | | C | | | F | | | B | |

Intersection Summary

Area Type: Other
 Cycle Length: 133
 Actuated Cycle Length: 133
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.46
 Intersection Signal Delay: 63.2
 Intersection LOS: E
 Intersection Capacity Utilization 102.2%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 118: Royal Forest /Royal Forest & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
 121: US 59 SBFR

PM Peak Hour



| Lane Group | NBT | NBR | SBU | SBL | SBT | NWL | NWR |
|--------------------------------|------|-------|-------|------|-------|------|-------|
| Lane Configurations | | | | | | | |
| Volume (vph) | 0 | 0 | 149 | 0 | 463 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.81 | 1.00 | 1.00 |
| Frt | | | | | | | |
| Flt Protected | | | 0.950 | | | | |
| Satd. Flow (prot) | 0 | 0 | 1770 | 0 | 7544 | 0 | 0 |
| Flt Permitted | | | 0.950 | | | | |
| Satd. Flow (perm) | 0 | 0 | 1770 | 0 | 7544 | 0 | 0 |
| Link Speed (mph) | 30 | | | | 30 | 30 | |
| Link Distance (ft) | 202 | | | | 6181 | 331 | |
| Travel Time (s) | 4.6 | | | | 140.5 | 7.5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.79 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 213 | 0 | 569 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 213 | 0 | 569 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No |
| Lane Alignment | Left | Right | R NA | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | | 12 | 0 | |
| Link Offset(ft) | 0 | | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 33.8% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
 122: US 59 NBFR

PM Peak Hour



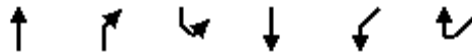
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|----------------------------|-------|-------|------|------|-------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 149 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | 0.950 | | | | | |
| Satd. Flow (prot) | 1770 | 0 | 0 | 5085 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | |
| Satd. Flow (perm) | 1770 | 0 | 0 | 5085 | 0 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 331 | | | 217 | 6159 | |
| Travel Time (s) | 7.5 | | | 4.9 | 140.0 | |
| Peak Hour Factor | 0.79 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 213 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 213 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 0 | 0 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | | | 9 |
| Sign Control | Yield | | | Free | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 27.4% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
 123: US 59 SBFR

PM Peak Hour



| Lane Group | NBT | NBR | SBL | SBT | SWL | SWR |
|----------------------------|-------|-------|------|------|-------|-------|
| Lane Configurations | | | | ↑↑↑ | ↘ | |
| Volume (vph) | 0 | 0 | 0 | 1230 | 198 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | 0.950 | |
| Satd. Flow (prot) | 0 | 0 | 0 | 5085 | 1770 | 0 |
| Flt Permitted | | | | | 0.950 | |
| Satd. Flow (perm) | 0 | 0 | 0 | 5085 | 1770 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 6715 | | | 184 | 304 | |
| Travel Time (s) | 152.6 | | | 4.2 | 6.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 1511 | 243 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 1511 | 243 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 0 | | | 0 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Yield | |

Intersection Summary

| | |
|-----------------------------------|------------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 45.9% ICU Level of Service A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
 124: US 59 NBFR

PM Peak Hour



| Lane Group | NBU | NBL | NBT | SBT | SBR | SEL | SER |
|----------------------------|----------|------|----------|------|-------|------|-------|
| Lane Configurations | A | | B | | | | |
| Volume (vph) | 198 | 0 | 1986 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 0.76 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | | |
| Flt Protected | 0.950 | | | | | | |
| Satd. Flow (prot) | 1770 | 0 | 8494 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | |
| Satd. Flow (perm) | 1770 | 0 | 8494 | 0 | 0 | 0 | 0 |
| Link Speed (mph) | | | 30 | 30 | | 30 | |
| Link Distance (ft) | | | 423 | 180 | | 304 | |
| Travel Time (s) | | | 9.6 | 4.1 | | 6.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 243 | 0 | 2439 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 243 | 0 | 2439 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Left | Left | Right | Left | Right |
| Median Width(ft) | | | 12 | 12 | | 0 | |
| Link Offset(ft) | | | 0 | 0 | | 0 | |
| Crosswalk Width(ft) | | | 16 | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | 15 | | | 9 | 15 | 9 |
| Sign Control | | | Free | Stop | | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 45.9% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

| Lane Group | ø2 | ø15 |
|----------------------------|----|-----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 125: Chestnut Ridge Dr. & Kingwood Dr.

PM Peak Hour

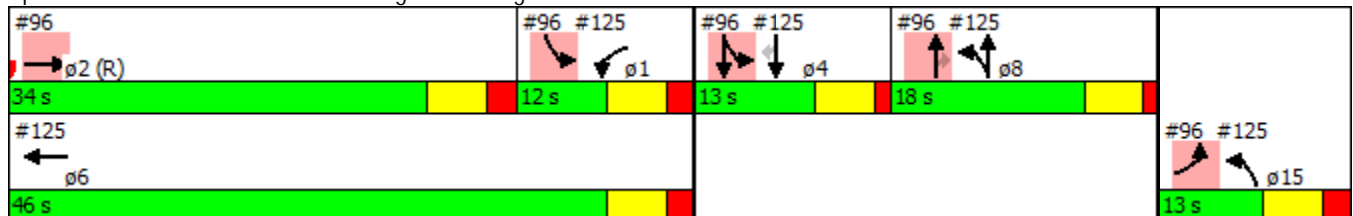


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-----|-----|-------|-------|-----|------|-------|-----|-----|-------|-------|
| Detector Phase | | | | 1 | 6 | | 15 | 8 | | | 4 | 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | 5.0 | 4.0 | | | 5.0 | | | 5.0 | 5.0 |
| Minimum Split (s) | | | | 11.0 | 10.0 | | | 18.0 | | | 10.0 | 10.0 |
| Total Split (s) | | | | 12.0 | 46.0 | | | 18.0 | | | 13.0 | 13.0 |
| Total Split (%) | | | | 13.3% | 51.1% | | | 20.0% | | | 14.4% | 14.4% |
| Maximum Green (s) | | | | 6.0 | 40.0 | | | 13.0 | | | 8.0 | 8.0 |
| Yellow Time (s) | | | | 4.0 | 4.0 | | | 4.0 | | | 4.0 | 4.0 |
| All-Red Time (s) | | | | 2.0 | 2.0 | | | 1.0 | | | 1.0 | 1.0 |
| Lost Time Adjust (s) | | | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | 0.0 |
| Total Lost Time (s) | | | | 6.0 | 6.0 | | | 5.0 | | | 5.0 | 5.0 |
| Lead/Lag | | | | Lag | | | | Lag | | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | | | Yes | | | Yes | Yes |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | | | 3.0 | | | 3.0 | 3.0 |
| Recall Mode | | | | None | None | | | None | | | None | None |
| Walk Time (s) | | | | | | | | 6.0 | | | | |
| Flash Dont Walk (s) | | | | | | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | 0 | | | | |
| Act Effect Green (s) | | | | 6.0 | 40.8 | | 24.2 | 11.4 | | | 8.0 | 8.0 |
| Actuated g/C Ratio | | | | 0.07 | 0.45 | | 0.27 | 0.13 | | | 0.09 | 0.09 |
| v/c Ratio | | | | 0.92 | 0.91 | | 0.17 | 0.61 | | | 0.98 | 0.42 |
| Control Delay | | | | 109.4 | 33.3 | | 8.7 | 45.9 | | | 109.3 | 3.8 |
| Queue Delay | | | | 59.8 | 0.0 | | 0.0 | 0.0 | | | 3.0 | 0.0 |
| Total Delay | | | | 169.2 | 33.3 | | 8.7 | 45.9 | | | 112.3 | 3.8 |
| LOS | | | | F | C | | A | D | | | F | A |
| Approach Delay | | | | | 42.8 | | | 32.4 | | | 60.2 | |
| Approach LOS | | | | | D | | | C | | | E | |

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 44.2 Intersection LOS: D
 Intersection Capacity Utilization 97.5% ICU Level of Service F
 Analysis Period (min) 15

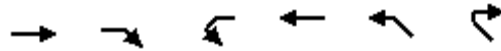
Splits and Phases: 125: Chestnut Ridge Dr. & Kingwood Dr.



| Lane Group | ø2 | ø15 |
|-----------------------------|-------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 4.0 | 5.0 |
| Minimum Split (s) | 20.0 | 11.0 |
| Total Split (s) | 34.0 | 13.0 |
| Total Split (%) | 38% | 14% |
| Maximum Green (s) | 28.0 | 7.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | C-Max | None |
| Walk Time (s) | 4.0 | |
| Flash Dont Walk (s) | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effect Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 126: Kingwood Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NWL | NWR |
|----------------------------|------|-------|------|------|------|-------|
| Lane Configurations | ↑↑ | | | ↑↑ | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 3539 | 0 | 0 | 3539 | 0 | 0 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 3539 | 0 | 0 | 3539 | 0 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 1032 | | | 502 | 530 | |
| Travel Time (s) | 23.5 | | | 11.4 | 12.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 0 | | | 0 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|-----------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% ICU Level of Service A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
 128: Kingwood Dr. & Green Oak Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 39 | 1066 | 194 | 132 | 76 | 0 | 0 | 357 | 32 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 150 | | 150 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 1 | | 1 | 1 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | | | | | 0.850 | | | | | | 0.988 |
| Flt Protected | | | | 0.950 | | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 1770 | 3539 | 1583 | 1770 | 1863 | 0 | 0 | 3497 | 0 |
| Flt Permitted | | | | 0.950 | | | 0.950 | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 1770 | 3539 | 1583 | 1770 | 1863 | 0 | 0 | 3497 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 159 | | | | | | 5 |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | | 30 |
| Link Distance (ft) | | 558 | | | 1505 | | | 89 | | | | 240 |
| Travel Time (s) | | 12.7 | | | 34.2 | | | 2.0 | | | | 5.5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% | 117% |
| Adj. Flow (vph) | 0 | 0 | 0 | 50 | 1356 | 247 | 168 | 97 | 0 | 0 | 454 | 41 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 50 | 1356 | 247 | 168 | 97 | 0 | 0 | 495 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | | 12 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | | | | 1 | 2 | 1 | 1 | 2 | | | | 2 |
| Detector Template | | | | Left | Thru | Right | Left | Thru | | | | Thru |
| Leading Detector (ft) | | | | 20 | 100 | 20 | 20 | 100 | | | | 100 |
| Trailing Detector (ft) | | | | 0 | 0 | 0 | 0 | 0 | | | | 0 |
| Detector 1 Position(ft) | | | | 0 | 0 | 0 | 0 | 0 | | | | 0 |
| Detector 1 Size(ft) | | | | 20 | 6 | 20 | 20 | 6 | | | | 6 |
| Detector 1 Type | | | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | | | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 |
| Detector 1 Queue (s) | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 |
| Detector 1 Delay (s) | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 |
| Detector 2 Position(ft) | | | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | | | | Prot | NA | Perm | Prot | NA | | | | NA |
| Protected Phases | | | | 1 | 6 | | 15 | 8 | | | | 4 |
| Permitted Phases | | | | | | | 6 | | | | | |

| Lane Group | ø2 | ø15 |
|----------------------------|----|-----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphp) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 128: Kingwood Dr. & Green Oak Dr.

PM Peak Hour

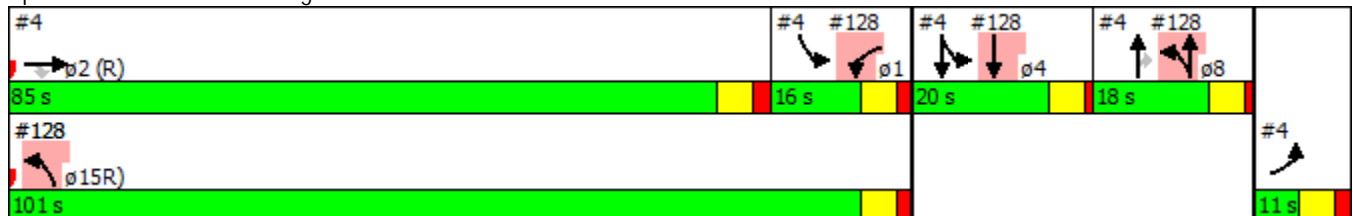


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-----|-----|-------|-------|-------|------|-------|-----|-----|-----|-------|
| Detector Phase | | | | 1 | 6 | 6 | 15 | 8 | | | | 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | 5.0 | 4.0 | 4.0 | | 5.0 | | | | 5.0 |
| Minimum Split (s) | | | | 11.0 | 10.0 | 10.0 | | 18.0 | | | | 10.0 |
| Total Split (s) | | | | 16.0 | 101.0 | 101.0 | | 18.0 | | | | 20.0 |
| Total Split (%) | | | | 10.7% | 67.3% | 67.3% | | 12.0% | | | | 13.3% |
| Maximum Green (s) | | | | 10.0 | 95.0 | 95.0 | | 13.0 | | | | 15.0 |
| Yellow Time (s) | | | | 4.0 | 4.0 | 4.0 | | 4.0 | | | | 4.0 |
| All-Red Time (s) | | | | 2.0 | 2.0 | 2.0 | | 1.0 | | | | 1.0 |
| Lost Time Adjust (s) | | | | 0.0 | 0.0 | 0.0 | | 0.0 | | | | 0.0 |
| Total Lost Time (s) | | | | 6.0 | 6.0 | 6.0 | | 5.0 | | | | 5.0 |
| Lead/Lag | | | | Lag | | | | Lag | | | | Lead |
| Lead-Lag Optimize? | | | | Yes | | | | Yes | | | | Yes |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | | 3.0 | | | | 3.0 |
| Recall Mode | | | | None | C-Max | C-Max | | None | | | | None |
| Walk Time (s) | | | | | | | | 6.0 | | | | |
| Flash Dont Walk (s) | | | | | | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | 0 | | | | |
| Act Effect Green (s) | | | | 10.0 | 95.0 | 95.0 | 23.0 | 13.0 | | | | 15.0 |
| Actuated g/C Ratio | | | | 0.07 | 0.63 | 0.63 | 0.15 | 0.09 | | | | 0.10 |
| v/c Ratio | | | | 0.42 | 0.61 | 0.23 | 0.62 | 0.60 | | | | 1.40 |
| Control Delay | | | | 78.7 | 17.8 | 4.6 | 7.4 | 40.3 | | | | 241.8 |
| Queue Delay | | | | 9.9 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 3.9 |
| Total Delay | | | | 88.6 | 17.8 | 4.6 | 7.4 | 40.3 | | | | 245.7 |
| LOS | | | | F | B | A | A | D | | | | F |
| Approach Delay | | | | | 18.0 | | | 19.4 | | | | 245.7 |
| Approach LOS | | | | | B | | | B | | | | F |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 117 (78%), Referenced to phase 2:EBT and 6:, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.40
 Intersection Signal Delay: 64.8
 Intersection LOS: E
 Intersection Capacity Utilization 132.5%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 128: Kingwood Dr. & Green Oak Dr.



| Lane Group | ø2 | ø15 |
|-----------------------------|-------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 4.0 | 5.0 |
| Minimum Split (s) | 20.0 | 11.0 |
| Total Split (s) | 85.0 | 11.0 |
| Total Split (%) | 57% | 7% |
| Maximum Green (s) | 79.0 | 5.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | C-Max | None |
| Walk Time (s) | 4.0 | |
| Flash Dont Walk (s) | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 133: Kingwood Dr.

PM Peak Hour



| Lane Group | NBL | NBR | NET | NER | SWL | SWT |
|----------------------------|------|-------|------|-------|------|------|
| Lane Configurations | | ↑↑ | | | | ↑↑ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 0.88 | 1.00 | 1.00 | 1.00 | 0.95 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 3278 | 0 | 0 | 0 | 3539 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 3278 | 0 | 0 | 0 | 3539 |
| Link Speed (mph) | 30 | | 30 | | | 30 |
| Link Distance (ft) | 922 | | 905 | | | 1945 |
| Travel Time (s) | 21.0 | | 20.6 | | | 44.2 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 100 | | 100 | | | 100 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Free | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|-----------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% ICU Level of Service A |
| Analysis Period (min) | 15 |

| Lane Group | ø2 | ø15 |
|----------------------------|----|-----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 136: Kingwood Dr. & Lake Kingwood Trail

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-----|-----|-------|-------|-----|-----|-------|-----|-----|-----|-------|
| Detector Phase | | | | 1 | 6 | | 15 | 8 | | | | 4 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | 5.0 | 4.0 | | | 5.0 | | | | 5.0 |
| Minimum Split (s) | | | | 11.0 | 10.0 | | | 18.0 | | | | 10.0 |
| Total Split (s) | | | | 14.0 | 109.0 | | | 19.0 | | | | 11.0 |
| Total Split (%) | | | | 9.3% | 72.7% | | | 12.7% | | | | 7.3% |
| Maximum Green (s) | | | | 8.0 | 103.0 | | | 14.0 | | | | 6.0 |
| Yellow Time (s) | | | | 4.0 | 4.0 | | | 4.0 | | | | 4.0 |
| All-Red Time (s) | | | | 2.0 | 2.0 | | | 1.0 | | | | 1.0 |
| Lost Time Adjust (s) | | | | 0.0 | 0.0 | | | 0.0 | | | | 0.0 |
| Total Lost Time (s) | | | | 6.0 | 6.0 | | | 5.0 | | | | 5.0 |
| Lead/Lag | | | | Lag | | | | Lag | | | | Lead |
| Lead-Lag Optimize? | | | | Yes | | | | Yes | | | | Yes |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | | | 3.0 | | | | 3.0 |
| Recall Mode | | | | None | C-Max | | | None | | | | None |
| Walk Time (s) | | | | | | | | 6.0 | | | | |
| Flash Dont Walk (s) | | | | | | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | 0 | | | | |
| Act Effct Green (s) | | | | 8.0 | 109.9 | | | 18.1 | | | | 6.0 |
| Actuated g/C Ratio | | | | 0.05 | 0.73 | | | 0.12 | | | | 0.04 |
| v/c Ratio | | | | 0.67 | 0.54 | | | 0.16 | | | | 0.82 |
| Control Delay | | | | 101.5 | 10.3 | | | 11.8 | | | | 102.2 |
| Queue Delay | | | | 0.0 | 0.0 | | | 3.9 | | | | 0.0 |
| Total Delay | | | | 101.5 | 10.3 | | | 15.7 | | | | 102.2 |
| LOS | | | | F | B | | | B | | | | F |
| Approach Delay | | | | | 14.3 | | | 15.7 | | | | 102.2 |
| Approach LOS | | | | | B | | | B | | | | F |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 20.8 Intersection LOS: C
 Intersection Capacity Utilization 54.6% ICU Level of Service A
 Analysis Period (min) 15

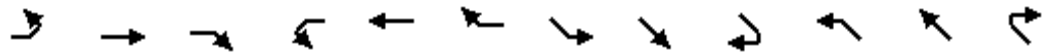
Splits and Phases: 136: Kingwood Dr. & Lake Kingwood Trail



| Lane Group | ø2 | ø15 |
|-------------------------|-------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 4.0 | 5.0 |
| Minimum Split (s) | 20.0 | 11.0 |
| Total Split (s) | 95.0 | 11.0 |
| Total Split (%) | 63% | 7% |
| Maximum Green (s) | 89.0 | 5.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | C-Max | None |
| Walk Time (s) | 4.0 | |
| Flash Dont Walk (s) | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effect Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 139: Kingwood High School & Kingwood Dr.

PM Peak Hour

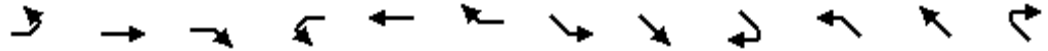


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|----------------------------|------|------|-------|------|-------|-------|------|-------|-------|------|-------|-------|
| Lane Configurations | | | | | ↑↑ | ↑ | | ↑↑ | ↑ | | ↑ | |
| Volume (vph) | 0 | 0 | 0 | 0 | 1158 | 123 | 0 | 165 | 46 | 0 | 18 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 0 | | 150 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 0 | | 1 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | 0.850 | | | 0.850 | | | |
| Flt Protected | | | | | | | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3539 | 1583 | 0 | 3539 | 1583 | 0 | 1863 | 0 |
| Flt Permitted | | | | | | | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3539 | 1583 | 0 | 3539 | 1583 | 0 | 1863 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 124 | | | 102 | | | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 156 | | | 905 | | | 317 | | | 170 | |
| Travel Time (s) | | 3.5 | | | 20.6 | | | 7.2 | | | 3.9 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.90 | 0.75 | 0.92 | 0.81 | 0.89 | 0.92 | 0.56 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 1454 | 185 | 0 | 230 | 58 | 0 | 36 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 1454 | 185 | 0 | 230 | 58 | 0 | 36 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 60 | | | 60 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | | | | | NA | Perm | | NA | Perm | Prot | NA | |
| Protected Phases | | | | | 6 | | | 4 | | 15 | 8 | |
| Permitted Phases | | | | | | 6 | | | 4 | | | |
| Minimum Split (s) | | | | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | |
| Total Split (s) | | | | | 107.0 | 107.0 | | 20.0 | 20.0 | | 11.0 | |
| Total Split (%) | | | | | 71.3% | 71.3% | | 13.3% | 13.3% | | 7.3% | |
| Maximum Green (s) | | | | | 101.0 | 101.0 | | 15.0 | 15.0 | | 6.0 | |
| Yellow Time (s) | | | | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | |
| All-Red Time (s) | | | | | 2.0 | 2.0 | | 1.0 | 1.0 | | 1.0 | |
| Lost Time Adjust (s) | | | | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | |
| Total Lost Time (s) | | | | | 6.0 | 6.0 | | 5.0 | 5.0 | | 5.0 | |
| Lead/Lag | | | | | | | | Lead | Lead | | Lag | |
| Lead-Lag Optimize? | | | | | | | | Yes | Yes | | Yes | |
| Act Effect Green (s) | | | | | 101.0 | 101.0 | | 15.0 | 15.0 | | 6.0 | |
| Actuated g/C Ratio | | | | | 0.67 | 0.67 | | 0.10 | 0.10 | | 0.04 | |
| v/c Ratio | | | | | 0.61 | 0.17 | | 0.65 | 0.23 | | 0.49 | |
| Control Delay | | | | | 15.0 | 3.4 | | 74.4 | 3.0 | | 155.6 | |
| Queue Delay | | | | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.6 | |
| Total Delay | | | | | 15.0 | 3.4 | | 74.4 | 3.0 | | 156.2 | |

| Lane Group | ø2 | ø15 |
|----------------------------|-------|------|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |
| Minimum Split (s) | 10.0 | 10.0 |
| Total Split (s) | 107.0 | 12.0 |
| Total Split (%) | 71% | 8% |
| Maximum Green (s) | 101.0 | 6.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | | |
| Lead-Lag Optimize? | | |
| Act Effect Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |

Alternative E: Direct Connector Kingwood to US 59
 139: Kingwood High School & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | SEL | SET | SER | NWL | NWT | NWR |
|----------------|-----|-----|-----|-----|------|-----|-----|------|-----|-----|-------|-----|
| LOS | | | | | B | A | | E | A | | F | |
| Approach Delay | | | | | 13.7 | | | 60.0 | | | 156.2 | |
| Approach LOS | | | | | B | | | E | | | F | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 0 (0%), Referenced to phase 2:NET and 6:, Start of Green |
| Natural Cycle: | 100 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.96 |
| Intersection Signal Delay: | 23.1 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 71.3% |
| ICU Level of Service | C |
| Analysis Period (min) | 15 |

Splits and Phases: 139: Kingwood High School & Kingwood Dr.



| | | |
|----------------------|----|-----|
| Lane Group | ø2 | ø15 |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 141: Lake Houston Parkway & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 336 | 856 | 551 | 169 | 484 | 206 | 527 | 798 | 124 | 322 | 824 | 232 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 150 | 150 | | 150 | 150 | | 150 | 150 | | 150 |
| Storage Lanes | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Fr _t | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Fl _t Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 | 3433 | 3539 | 1583 |
| Fl _t Permitted | 0.404 | | | 0.250 | | | 0.250 | | | 0.250 | | |
| Satd. Flow (perm) | 1460 | 3539 | 1583 | 903 | 3539 | 1583 | 903 | 3539 | 1583 | 903 | 3539 | 1583 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 37 | | | 43 | | | 36 | | | 158 |
| Link Speed (mph) | | 30 | | | 30 | | | 40 | | | 40 | |
| Link Distance (ft) | | 513 | | | 546 | | | 450 | | | 568 | |
| Travel Time (s) | | 11.7 | | | 12.4 | | | 7.7 | | | 9.7 | |
| Peak Hour Factor | 0.98 | 0.96 | 0.96 | 0.83 | 0.93 | 0.82 | 0.96 | 0.94 | 0.82 | 0.93 | 0.93 | 0.85 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 387 | 1008 | 649 | 230 | 588 | 284 | 620 | 959 | 171 | 391 | 1001 | 308 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 387 | 1008 | 649 | 230 | 588 | 284 | 620 | 959 | 171 | 391 | 1001 | 308 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 30 | | | 30 | | | 75 | | | 75 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | 2 | | 2 | 6 | | 6 |
| Minimum Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Total Split (s) | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 |
| Yellow Time (s) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Act Effect Green (s) | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 |
| v/c Ratio | 0.66 | 0.71 | 0.99 | 0.64 | 0.42 | 0.43 | 1.72 | 0.68 | 0.26 | 1.08 | 0.71 | 0.42 |

Alternative E: Direct Connector Kingwood to US 59
 141: Lake Houston Parkway & Kingwood Dr.

PM Peak Hour

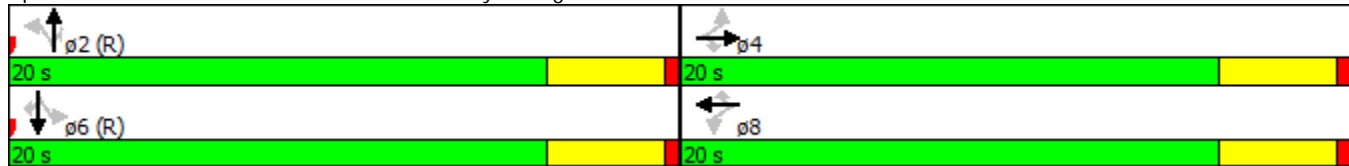


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|------|------|------|------|-----|-----|-------|------|-----|------|------|-----|
| Control Delay | 17.4 | 13.5 | 50.1 | 14.5 | 5.6 | 5.3 | 353.4 | 12.9 | 7.8 | 91.8 | 13.4 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 17.4 | 13.5 | 50.1 | 14.5 | 5.6 | 5.3 | 353.4 | 12.9 | 7.8 | 91.8 | 13.4 | 6.5 |
| LOS | B | B | D | B | A | A | F | B | A | F | B | A |
| Approach Delay | 25.8 | | | | 7.4 | | 133.0 | | | | 30.2 | |
| Approach LOS | C | | | | A | | F | | | | C | |

Intersection Summary

| | |
|-----------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 40 |
| Actuated Cycle Length: | 40 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 55 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 1.72 |
| Intersection Signal Delay: | 52.3 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 88.2% |
| ICU Level of Service | E |
| Analysis Period (min) | 15 |

Splits and Phases: 141: Lake Houston Parkway & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
 144: Forest Garden Dr. & Kingwood Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 166 | 1172 | 130 | 3 | 702 | 14 | 151 | 126 | 277 | 45 | 18 | 125 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 150 | | 0 | 150 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Frt | | 0.983 | | | 0.996 | | | 0.924 | | | 0.911 | |
| Flt Protected | 0.950 | | | 0.950 | | | | 0.990 | | | 0.988 | |
| Satd. Flow (prot) | 1770 | 3479 | 0 | 1770 | 3525 | 0 | 0 | 3238 | 0 | 0 | 3186 | 0 |
| Flt Permitted | 0.250 | | | 0.250 | | | | 0.814 | | | 0.700 | |
| Satd. Flow (perm) | 466 | 3479 | 0 | 466 | 3525 | 0 | 0 | 2662 | 0 | 0 | 2257 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 40 | | | 9 | | | 9 | | | 53 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 821 | | | 549 | | | 426 | | | 481 | |
| Travel Time (s) | | 18.7 | | | 12.5 | | | 9.7 | | | 10.9 | |
| Peak Hour Factor | 0.92 | 0.96 | 0.85 | 0.75 | 0.88 | 0.58 | 0.84 | 0.50 | 0.63 | 0.80 | 0.45 | 0.89 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 204 | 1380 | 173 | 5 | 901 | 27 | 203 | 285 | 497 | 64 | 45 | 159 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 204 | 1553 | 0 | 5 | 928 | 0 | 0 | 985 | 0 | 0 | 268 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 40 | | | 50 | | | 40 | | | 40 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Total Split (s) | 20.0 | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 16.0 | 16.0 | | 16.0 | 16.0 | | 16.0 | 16.0 | | 16.0 | 16.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 0.5 | 0.5 | | 0.5 | 0.5 | | 0.5 | 0.5 | | 0.5 | 0.5 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Walk Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effect Green (s) | 16.0 | 16.0 | | 16.0 | 16.0 | | 16.0 | 16.0 | | 16.0 | 16.0 | |
| Actuated g/C Ratio | 0.40 | 0.40 | | 0.40 | 0.40 | | 0.40 | 0.40 | | 0.40 | 0.40 | |
| v/c Ratio | 1.10 | 1.10 | | 0.03 | 0.66 | | 0.92 | 0.92 | | 0.29 | 0.29 | |

Alternative E: Direct Connector Kingwood to US 59
 144: Forest Garden Dr. & Kingwood Dr.

PM Peak Hour

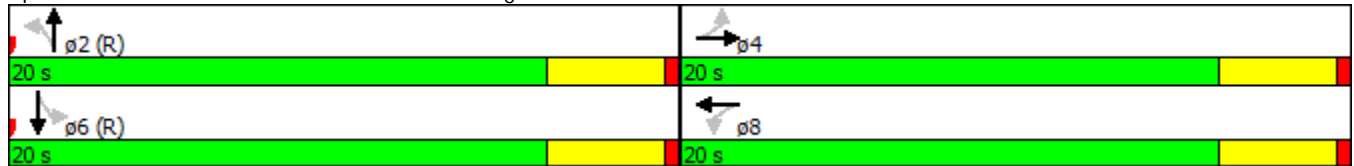


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|-------|------|-----|-----|------|-----|-----|------|-----|-----|-----|-----|
| Control Delay | 105.8 | 66.4 | | 7.8 | 12.4 | | | 28.8 | | | 7.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | 105.8 | 66.4 | | 7.8 | 12.4 | | | 28.8 | | | 7.5 | |
| LOS | F | E | | A | B | | | C | | | A | |
| Approach Delay | | 70.9 | | | 12.4 | | | 28.8 | | | 7.5 | |
| Approach LOS | | E | | | B | | | C | | | A | |

Intersection Summary

| | |
|-----------------------------------|---|
| Area Type: | Other |
| Cycle Length: | 40 |
| Actuated Cycle Length: | 40 |
| Offset: | 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 1.10 |
| Intersection Signal Delay: | 42.2 |
| Intersection LOS: | D |
| Intersection Capacity Utilization | 83.5% |
| ICU Level of Service | E |
| Analysis Period (min) | 15 |

Splits and Phases: 144: Forest Garden Dr. & Kingwood Dr.



Alternative E: Direct Connector Kingwood to US 59
 147: Kingwood Dr. & Timber Shade Dr.

PM Peak Hour



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------------------|------|------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 1 | 676 | 7 | 29 | 111 | 0 | 0 | 8 | 73 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 150 | | 0 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 1 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | | | | 0.997 | | | | | | 0.873 | |
| Flt Protected | | | | 0.950 | | | | 0.987 | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 1770 | 3529 | 0 | 0 | 3493 | 0 | 0 | 3090 | 0 |
| Flt Permitted | | | | 0.950 | | | | 0.987 | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 1770 | 3529 | 0 | 0 | 3493 | 0 | 0 | 3090 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | 2 | | | | | | 99 | |
| Link Speed (mph) | | 30 | | | 30 | | | 30 | | | 30 | |
| Link Distance (ft) | | 833 | | | 1635 | | | 136 | | | 459 | |
| Travel Time (s) | | 18.9 | | | 37.2 | | | 3.1 | | | 10.4 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.25 | 0.96 | 0.58 | 0.60 | 0.84 | 0.92 | 0.92 | 0.50 | 0.83 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 5 | 796 | 14 | 55 | 149 | 0 | 0 | 18 | 99 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 5 | 810 | 0 | 0 | 204 | 0 | 0 | 117 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | | | | Prot | NA | | Prot | NA | | | NA | |
| Protected Phases | | | | 1 | 6 | | 15 | 8 | | | 4 | |
| Permitted Phases | | | | | | | | | | | | |
| Minimum Split (s) | | | | 11.0 | 10.0 | | | 18.0 | | | 10.0 | |
| Total Split (s) | | | | 11.0 | 93.0 | | | 18.0 | | | 12.0 | |
| Total Split (%) | | | | 7.3% | 62.0% | | | 12.0% | | | 8.0% | |
| Maximum Green (s) | | | | 5.0 | 87.0 | | | 13.0 | | | 7.0 | |
| Yellow Time (s) | | | | 4.0 | 4.0 | | | 4.0 | | | 4.0 | |
| All-Red Time (s) | | | | 2.0 | 2.0 | | | 1.0 | | | 1.0 | |
| Lost Time Adjust (s) | | | | 0.0 | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | | | 6.0 | 6.0 | | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | Lag | | | | Lag | | | Lead | |
| Lead-Lag Optimize? | | | | Yes | | | | Yes | | | Yes | |
| Walk Time (s) | | | | | | | | 6.0 | | | | |
| Flash Dont Walk (s) | | | | | | | | 7.0 | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | 0 | | | | |
| Act Effect Green (s) | | | | 5.0 | 87.0 | | | 40.0 | | | 7.0 | |
| Actuated g/C Ratio | | | | 0.03 | 0.58 | | | 0.27 | | | 0.05 | |
| v/c Ratio | | | | 0.08 | 0.40 | | | 0.22 | | | 0.49 | |

| Lane Group | ø2 | ø15 |
|----------------------------|------|------|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |
| Minimum Split (s) | 20.0 | 11.0 |
| Total Split (s) | 82.0 | 27.0 |
| Total Split (%) | 55% | 18% |
| Maximum Green (s) | 76.0 | 21.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Walk Time (s) | 4.0 | |
| Flash Dont Walk (s) | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |

Alternative E: Direct Connector Kingwood to US 59
 147: Kingwood Dr. & Timber Shade Dr.

PM Peak Hour

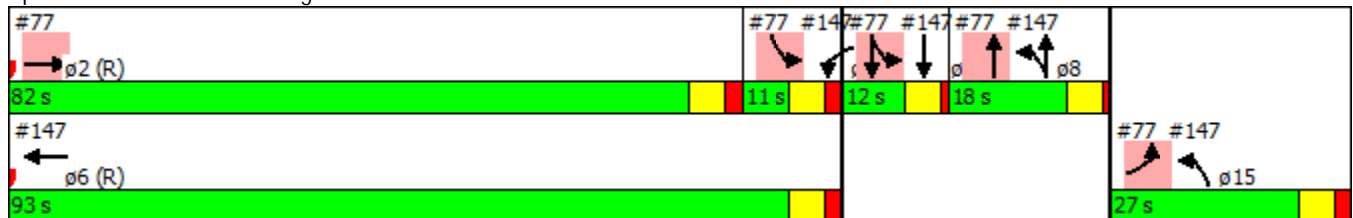


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|-----|-----|-----|------|------|-----|-----|-----|-----|-----|------|-----|
| Control Delay | | | | 73.0 | 17.8 | | | 2.8 | | | 25.0 | |
| Queue Delay | | | | 0.0 | 0.0 | | | 1.1 | | | 0.0 | |
| Total Delay | | | | 73.0 | 17.8 | | | 3.9 | | | 25.0 | |
| LOS | | | | E | B | | | A | | | C | |
| Approach Delay | | | | | 18.2 | | | 3.9 | | | 25.0 | |
| Approach LOS | | | | | B | | | A | | | C | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 48 (32%), Referenced to phase 2:EBT and 6:, Start of Green |
| Natural Cycle: | 90 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.75 |
| Intersection Signal Delay: | 16.3 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 39.0% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |


















Splits and Phases: 147: Kingwood Dr. & Timber Shade Dr.



| Lane Group | ø2 | ø15 |
|----------------------|----|-----|
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 149: Kingwood Dr. & Willow Terrace

PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---|---|---|---|---|---|--|---|---|---|---|---|
| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Lane Configurations | |  | |  |  | | | | |  |  | |
| Volume (vph) | 0 | 20 | 56 | 299 | 96 | 0 | 0 | 0 | 0 | 34 | 349 | 6 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 0 | | 0 | 0 | | 0 | 150 | | 0 |
| Storage Lanes | 0 | | 0 | 1 | | 0 | 0 | | 0 | 2 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.901 | | | | | | | | | | 0.996 |
| Flt Protected | | | | 0.950 | 0.980 | | | | | 0.950 | | |
| Satd. Flow (prot) | 0 | 3189 | 0 | 1681 | 1734 | 0 | 0 | 0 | 0 | 1770 | 3525 | 0 |
| Flt Permitted | | | | 0.950 | 0.980 | | | | | 0.950 | | |
| Satd. Flow (perm) | 0 | 3189 | 0 | 1681 | 1734 | 0 | 0 | 0 | 0 | 1770 | 3525 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 77 | | | | | | | | | | 4 |
| Link Speed (mph) | | 30 | | | 30 | | | 40 | | | | 40 |
| Link Distance (ft) | | 359 | | | 105 | | | 1385 | | | | 466 |
| Travel Time (s) | | 8.2 | | | 2.4 | | | 23.6 | | | | 7.9 |
| Peak Hour Factor | 0.92 | 0.56 | 0.82 | 0.92 | 0.71 | 0.92 | 0.92 | 0.92 | 0.92 | 0.77 | 0.77 | 0.50 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 40 | 77 | 367 | 153 | 0 | 0 | 0 | 0 | 50 | 512 | 14 |
| Shared Lane Traffic (%) | | | | 30% | | | | | | | | |
| Lane Group Flow (vph) | 0 | 117 | 0 | 257 | 263 | 0 | 0 | 0 | 0 | 50 | 526 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | | 12 |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | | 0 |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | | 16 |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | | NA | | Prot | NA | | | | | Prot | NA | |
| Protected Phases | | 4 | | 15 8 | 8 | | | | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Minimum Split (s) | | 10.0 | | | 18.0 | | | | | 11.0 | 10.0 | |
| Total Split (s) | | 10.0 | | | 18.0 | | | | | 11.0 | 31.0 | |
| Total Split (%) | | 14.3% | | | 25.7% | | | | | 15.7% | 44.3% | |
| Maximum Green (s) | | 5.0 | | | 13.0 | | | | | 5.0 | 25.0 | |
| Yellow Time (s) | | 4.0 | | | 4.0 | | | | | 4.0 | 4.0 | |
| All-Red Time (s) | | 1.0 | | | 1.0 | | | | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | | | 0.0 | 0.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | | | 6.0 | 6.0 | |
| Lead/Lag | | Lead | | | Lag | | | | | Lag | | |
| Lead-Lag Optimize? | | Yes | | | Yes | | | | | Yes | | |
| Walk Time (s) | | | | | 6.0 | | | | | | | |
| Flash Dont Walk (s) | | | | | 7.0 | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | 0 | | | | | | | |
| Act Effect Green (s) | | 5.0 | | 23.0 | 24.0 | | | | | 5.0 | 25.0 | |
| Actuated g/C Ratio | | 0.07 | | 0.33 | 0.34 | | | | | 0.07 | 0.36 | |
| v/c Ratio | | 0.39 | | 0.47 | 0.44 | | | | | 0.40 | 0.42 | |

| Lane Group | ø2 | ø15 |
|----------------------------|------|------|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |
| Minimum Split (s) | 20.0 | 11.0 |
| Total Split (s) | 20.0 | 11.0 |
| Total Split (%) | 29% | 16% |
| Maximum Green (s) | 14.0 | 5.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Walk Time (s) | 4.0 | |
| Flash Dont Walk (s) | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |

Alternative E: Direct Connector Kingwood to US 59
 149: Kingwood Dr. & Willow Terrace

PM Peak Hour

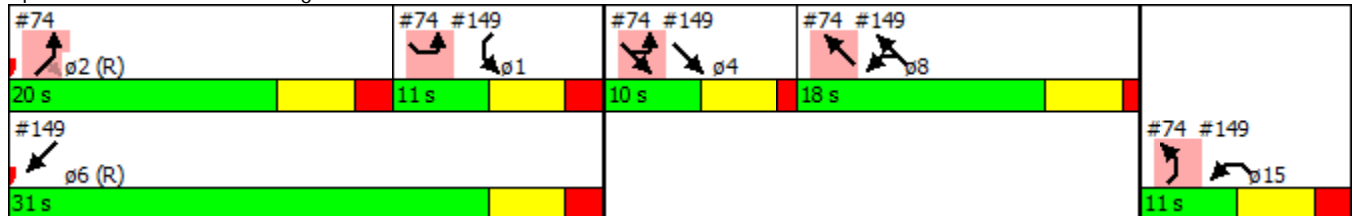


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|----------------|-----|------|-----|-----|-----|-----|-----|-----|-----|------|------|-----|
| Control Delay | | 17.7 | | 6.6 | 4.3 | | | | | 40.8 | 18.1 | |
| Queue Delay | | 0.0 | | 2.5 | 2.2 | | | | | 0.0 | 0.0 | |
| Total Delay | | 17.7 | | 9.1 | 6.5 | | | | | 40.8 | 18.1 | |
| LOS | | B | | A | A | | | | | D | B | |
| Approach Delay | | 17.7 | | | 7.8 | | | | | | 20.1 | |
| Approach LOS | | B | | | A | | | | | | C | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 70 |
| Actuated Cycle Length: | 70 |
| Offset: | 0 (0%), Referenced to phase 2:NEL and 6:, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.97 |
| Intersection Signal Delay: | 14.6 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 39.2% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 149: Kingwood Dr. & Willow Terrace



| Lane Group | ø2 | ø15 |
|----------------------|----|-----|
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

| Lane Group | ø2 | ø15 |
|----------------------------|------|------|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |
| Minimum Split (s) | 20.0 | 11.0 |
| Total Split (s) | 78.0 | 18.0 |
| Total Split (%) | 52% | 12% |
| Maximum Green (s) | 72.0 | 12.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Walk Time (s) | 4.0 | |
| Flash Dont Walk (s) | 10.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |

Alternative E: Direct Connector Kingwood to US 59
 151: Kingwood Dr. & High Valley

PM Peak Hour

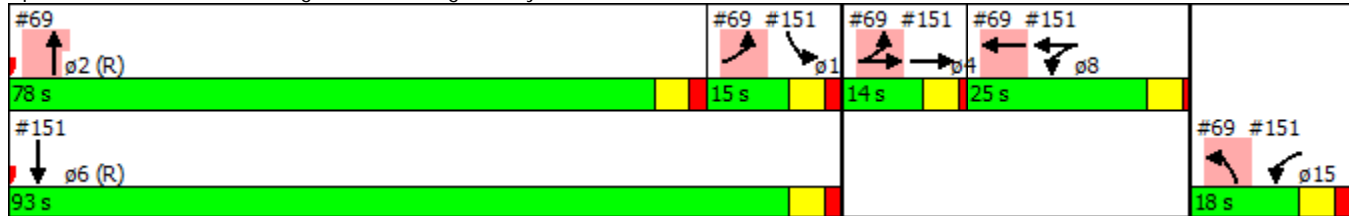


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|----------------|-----|------|-----|-----|------|-----|-----|-----|-----|-----|-----|------|
| LOS | | C | | C | C | | | | | | | B |
| Approach Delay | | 32.3 | | | 21.6 | | | | | | | 17.2 |
| Approach LOS | | C | | | C | | | | | | | B |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 48 (32%), Referenced to phase 2:NBT and 6:, Start of Green |
| Natural Cycle: | 70 |
| Control Type: | Pretimed |
| Maximum v/c Ratio: | 0.49 |
| Intersection Signal Delay: | 19.8 |
| Intersection LOS: | B |
| Intersection Capacity Utilization | 27.7% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Splits and Phases: 151: Kingwood Dr. & High Valley



| Lane Group | ø2 | ø15 |
|----------------------|----|-----|
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 154: Kingwood Dr. & Mills Branch

PM Peak Hour



| Lane Group | EBL | EBR | NWL | NWR | NEL | NET | NER | SWL | SWT | SWR |
|----------------------------|-------|-------|------|-------|------|------|-------|------|------|-------|
| Lane Configurations | | | | | | | | | | |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphp) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | | | | | |
| Flt Protected | | | | | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Flt Permitted | | | | | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Turn on Red | Yes | | | Yes | Yes | | Yes | Yes | | Yes |
| Satd. Flow (RTOR) | | | | | | | | | | |
| Link Speed (mph) | 30 | | 30 | | | 40 | | | 30 | |
| Link Distance (ft) | 8307 | | 71 | | | 1448 | | | 286 | |
| Travel Time (s) | 188.8 | | 1.6 | | | 24.7 | | | 6.5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | 0 | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | 0 | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | 15 | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | | | | | | | | | | |
| Protected Phases | | | | | | | | | | |
| Permitted Phases | | | | | | | | | | |
| Minimum Split (s) | | | | | | | | | | |
| Total Split (s) | | | | | | | | | | |
| Total Split (%) | | | | | | | | | | |
| Maximum Green (s) | | | | | | | | | | |
| Yellow Time (s) | | | | | | | | | | |
| All-Red Time (s) | | | | | | | | | | |
| Lost Time Adjust (s) | | | | | | | | | | |
| Total Lost Time (s) | | | | | | | | | | |
| Lead/Lag | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | |
| Act Effect Green (s) | | | | | | | | | | |
| Actuated g/C Ratio | | | | | | | | | | |
| v/c Ratio | | | | | | | | | | |
| Control Delay | | | | | | | | | | |
| Queue Delay | | | | | | | | | | |
| Total Delay | | | | | | | | | | |
| LOS | | | | | | | | | | |
| Approach Delay | | | | | | | | | | |
| Approach LOS | | | | | | | | | | |

Intersection Summary

Area Type: Other

Cycle Length: 3

Actuated Cycle Length: 3

Offset: 0 (0%), Referenced to phase 2: and 6:, Start of Green

Natural Cycle: 40

Control Type: Pretimed

Maximum v/c Ratio: 0.00

Intersection Signal Delay: 0.0

Intersection LOS: A

Intersection Capacity Utilization 0.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 154: Kingwood Dr. & Mills Branch

| |
|--|
| |
|--|

Alternative E: Direct Connector Kingwood to US 59
 157: US 59 NBFR

PM Peak Hour



| Lane Group | NBU | NBT | NBR | SBL | SBT | SWL | SWR |
|----------------------------|----------|----------|-------|------|------|------|-------|
| Lane Configurations | A | B | | | | | |
| Volume (vph) | 246 | 2209 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 0.76 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | | |
| Flt Protected | 0.950 | | | | | | |
| Satd. Flow (prot) | 1770 | 8494 | 0 | 0 | 0 | 0 | 0 |
| Flt Permitted | 0.950 | | | | | | |
| Satd. Flow (perm) | 1770 | 8494 | 0 | 0 | 0 | 0 | 0 |
| Link Speed (mph) | | 30 | | | 30 | 30 | |
| Link Distance (ft) | | 6159 | | | 362 | 365 | |
| Travel Time (s) | | 140.0 | | | 8.2 | 8.3 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 302 | 2713 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | | |
| Lane Group Flow (vph) | 302 | 2713 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No |
| Lane Alignment | R NA | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | 0 | |
| Link Offset(ft) | | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | | 9 | 15 | | 15 | 9 |
| Sign Control | | Free | | | Stop | Stop | |

Intersection Summary

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

Alternative E: Direct Connector Kingwood to US 59
 159: Russel Palmer & Northpark Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | ø2 | ø4 |
|----------------------------|------|-------|--------|-------|-------|-------|----|----|
| Lane Configurations | | | | | | | | |
| Volume (vph) | 0 | 0 | 139 | 1170 | 158 | 0 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Storage Length (ft) | | 0 | 150 | | 0 | 0 | | |
| Storage Lanes | | 0 | 1 | | 1 | 0 | | |
| Taper Length (ft) | | | 25 | | 25 | | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | | |
| Fr _t | | | | | | | | |
| Fl _t Protected | | | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 0 | 0 | 1770 | 3539 | 1770 | 0 | | |
| Fl _t Permitted | | | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 0 | 0 | 1770 | 3539 | 1770 | 0 | | |
| Right Turn on Red | | Yes | | | | Yes | | |
| Satd. Flow (RTOR) | | | | | | | | |
| Link Speed (mph) | 30 | | | 45 | 30 | | | |
| Link Distance (ft) | 129 | | | 1996 | 80 | | | |
| Travel Time (s) | 2.9 | | | 30.2 | 1.8 | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.82 | 0.96 | 0.78 | 0.92 | | |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | | |
| Adj. Flow (vph) | 0 | 0 | 192 | 1377 | 229 | 0 | | |
| Shared Lane Traffic (%) | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 192 | 1377 | 229 | 0 | | |
| Enter Blocked Intersection | No | No | No | No | No | No | | |
| Lane Alignment | Left | Right | Left | Left | Left | Right | | |
| Median Width(ft) | 12 | | | 12 | 12 | | | |
| Link Offset(ft) | 0 | | | 0 | 0 | | | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | | | |
| Two way Left Turn Lane | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 | | |
| Number of Detectors | | | 1 | 2 | 1 | | | |
| Detector Template | | | Left | Thru | Left | | | |
| Leading Detector (ft) | | | 20 | 100 | 20 | | | |
| Trailing Detector (ft) | | | 0 | 0 | 0 | | | |
| Detector 1 Position(ft) | | | 0 | 0 | 0 | | | |
| Detector 1 Size(ft) | | | 20 | 6 | 20 | | | |
| Detector 1 Type | | | Cl+Ex | Cl+Ex | Cl+Ex | | | |
| Detector 1 Channel | | | | | | | | |
| Detector 1 Extend (s) | | | 0.0 | 0.0 | 0.0 | | | |
| Detector 1 Queue (s) | | | 0.0 | 0.0 | 0.0 | | | |
| Detector 1 Delay (s) | | | 0.0 | 0.0 | 0.0 | | | |
| Detector 2 Position(ft) | | | | 94 | | | | |
| Detector 2 Size(ft) | | | | 6 | | | | |
| Detector 2 Type | | | | Cl+Ex | | | | |
| Detector 2 Channel | | | | | | | | |
| Detector 2 Extend (s) | | | | 0.0 | | | | |
| Turn Type | | | custom | NA | NA | | | |
| Protected Phases | | | | 6 | 8 | | 2 | 4 |
| Permitted Phases | | | 1 | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 159: Russel Palmer & Northpark Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR | ø2 | ø4 |
|-----------------------|-----|-----|-------|-------|-------|-----|-------|------|
| Detector Phase | | | 1 | 6 | 8 | | | |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | | | 5.0 | 15.0 | 5.0 | | 15.0 | 5.0 |
| Minimum Split (s) | | | 11.3 | 21.3 | 11.2 | | 21.3 | 11.3 |
| Total Split (s) | | | 24.0 | 119.0 | 31.0 | | 95.0 | 31.0 |
| Total Split (%) | | | 16.0% | 79.3% | 20.7% | | 63% | 21% |
| Maximum Green (s) | | | 17.7 | 112.7 | 24.8 | | 88.7 | 24.7 |
| Yellow Time (s) | | | 4.3 | 4.3 | 3.6 | | 4.3 | 4.3 |
| All-Red Time (s) | | | 2.0 | 2.0 | 2.6 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | | | 0.0 | 0.0 | 0.0 | | | |
| Total Lost Time (s) | | | 6.3 | 6.3 | 6.2 | | | |
| Lead/Lag | | | Lead | | | | Lag | |
| Lead-Lag Optimize? | | | Yes | | | | Yes | |
| Vehicle Extension (s) | | | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 |
| Recall Mode | | | None | C-Max | Max | | C-Max | None |
| Act Effect Green (s) | | | 17.6 | 112.7 | 24.8 | | | |
| Actuated g/C Ratio | | | 0.12 | 0.75 | 0.17 | | | |
| v/c Ratio | | | 0.93 | 0.52 | 0.78 | | | |
| Control Delay | | | 110.3 | 8.4 | 18.2 | | | |
| Queue Delay | | | 108.5 | 0.0 | 0.0 | | | |
| Total Delay | | | 218.8 | 8.4 | 18.2 | | | |
| LOS | | | F | A | B | | | |
| Approach Delay | | | | 34.2 | 18.2 | | | |
| Approach LOS | | | | C | B | | | |

Intersection Summary

| | |
|-----------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 25 (17%), Referenced to phase 2:EBT and 6:, Start of Green |
| Natural Cycle: | 150 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.23 |
| Intersection Signal Delay: | 32.1 |
| Intersection LOS: | C |
| Intersection Capacity Utilization | 56.9% |
| ICU Level of Service | B |
| Analysis Period (min) | 15 |

Splits and Phases: 159: Russel Palmer & Northpark Dr.



Alternative E: Direct Connector Kingwood to US 59
 161: Northpark Dr.

PM Peak Hour



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|----------------------------|------|-------|------|-------|------|-------|
| Lane Configurations | | ↕↕ | | | | |
| Volume (vph) | 23 | 1930 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | 0.999 | | | | |
| Satd. Flow (prot) | 0 | 3536 | 0 | 0 | 0 | 0 |
| Flt Permitted | | 0.999 | | | | |
| Satd. Flow (perm) | 0 | 3536 | 0 | 0 | 0 | 0 |
| Link Speed (mph) | | 45 | 30 | | 30 | |
| Link Distance (ft) | | 2834 | 122 | | 96 | |
| Travel Time (s) | | 42.9 | 2.8 | | 2.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 28 | 2371 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 2399 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(ft) | | 0 | 0 | | 0 | |
| Link Offset(ft) | | 0 | 0 | | 0 | |
| Crosswalk Width(ft) | | 16 | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | | 9 | 15 | 9 |
| Sign Control | | Free | Stop | | Stop | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 109.2% |
| Analysis Period (min) | 15 |
| | ICU Level of Service H |

Alternative E: Direct Connector Kingwood to US 59
162: Northpark Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|----------------------------|------|-------|------|------|-------|-------|
| Lane Configurations | | | | ↑↑ | ↘ | |
| Volume (vph) | 0 | 0 | 0 | 1328 | 23 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 |
| Frt | | | | | | |
| Flt Protected | | | | | 0.950 | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3539 | 1770 | 0 |
| Flt Permitted | | | | | 0.950 | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3539 | 1770 | 0 |
| Link Speed (mph) | 45 | | | 30 | 30 | |
| Link Distance (ft) | 2832 | | | 129 | 96 | |
| Travel Time (s) | 42.9 | | | 2.9 | 2.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 1631 | 28 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 1631 | 28 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 0 | | | 0 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Yield | |

Intersection Summary

| | |
|-----------------------------------|------------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 51.5% ICU Level of Service A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
163: Northpark Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NEL | NER |
|----------------------------|------|-------|------|------|------|-------|
| Lane Configurations | | | | ↑↑ | | ↑↑ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 0.88 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Link Speed (mph) | 30 | | | 45 | 45 | |
| Link Distance (ft) | 1138 | | | 981 | 2386 | |
| Travel Time (s) | 25.9 | | | 14.9 | 36.2 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 40 | 40 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 40 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | | 15 | 15 | | 9 |
| Sign Control | Free | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|-----------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% ICU Level of Service A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
 164: Northpark Dr.

PM Peak Hour



| Lane Group | WBL | WBR | NET | NER | SWL | SWT |
|----------------------------|------|-------|------|-------|------|------|
| Lane Configurations | | | | ↑↑ | | ↑↑ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.88 | 1.00 | 0.95 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3278 | 0 | 3539 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3278 | 0 | 3539 |
| Link Speed (mph) | 40 | | 40 | | | 40 |
| Link Distance (ft) | 609 | | 2651 | | | 576 |
| Travel Time (s) | 10.4 | | 45.2 | | | 9.8 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 12 | | 12 | | | 12 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Stop | | Free | | | Free |

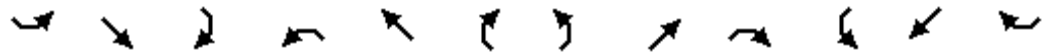
Intersection Summary

| | |
|-----------------------------------|-----------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% ICU Level of Service A |
| Analysis Period (min) | 15 |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
 165: Northpark Dr. & Rock Springs

PM Peak Hour

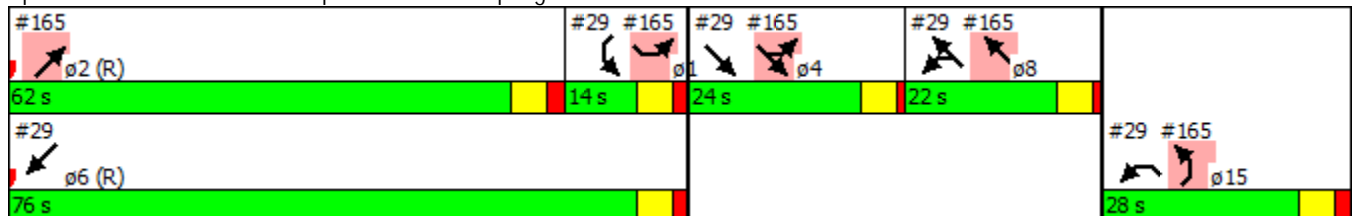


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------------|------|-------|-----|-----|-------|-----|-----|-------|-------|-----|-----|-----|
| Detector Phase | 1 4 | 4 | | | 8 | | | 15 | 2 | | | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | 5.0 | | | 5.0 | | | 5.0 | 4.0 | | | |
| Minimum Split (s) | | 22.0 | | | 20.0 | | | 11.0 | 18.0 | | | |
| Total Split (s) | | 24.0 | | | 22.0 | | | 28.0 | 62.0 | | | |
| Total Split (%) | | 16.0% | | | 14.7% | | | 18.7% | 41.3% | | | |
| Maximum Green (s) | | 19.0 | | | 17.0 | | | 22.0 | 56.0 | | | |
| Yellow Time (s) | | 4.0 | | | 4.0 | | | 4.0 | 4.0 | | | |
| All-Red Time (s) | | 1.0 | | | 1.0 | | | 2.0 | 2.0 | | | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | 0.0 | | | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | 6.0 | 6.0 | | | |
| Lead/Lag | | Lead | | | Lag | | | Lead | | | | |
| Lead-Lag Optimize? | | Yes | | | Yes | | | Yes | | | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | 3.0 | 3.0 | | | |
| Recall Mode | | None | | | Max | | | None | C-Max | | | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | | 5.0 | | | |
| Flash Dont Walk (s) | | 11.0 | | | 10.0 | | | | 7.0 | | | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | | 0 | | | |
| Act Effct Green (s) | 17.4 | 7.6 | | | 28.4 | | | 16.4 | 67.2 | | | |
| Actuated g/C Ratio | 0.12 | 0.05 | | | 0.19 | | | 0.11 | 0.45 | | | |
| v/c Ratio | 0.07 | 0.23 | | | 0.15 | | | 0.68 | 0.57 | | | |
| Control Delay | 20.1 | 31.6 | | | 41.2 | | | 81.6 | 33.7 | | | |
| Queue Delay | 0.0 | 0.0 | | | 0.0 | | | 0.0 | 0.0 | | | |
| Total Delay | 20.1 | 31.6 | | | 41.2 | | | 81.6 | 33.7 | | | |
| LOS | C | C | | | D | | | F | C | | | |
| Approach Delay | | 28.7 | | | 41.2 | | | | 39.9 | | | |
| Approach LOS | | C | | | D | | | | D | | | |

Intersection Summary

| | |
|------------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 45 (30%), Referenced to phase 2:NET and 6:, Start of Green |
| Natural Cycle: | 95 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 0.68 |
| Intersection Signal Delay: | 39.5 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 45.9% |
| ICU Level of Service: | A |
| Analysis Period (min): | 15 |

Splits and Phases: 165: Northpark Dr. & Rock Springs



| Lane Group | ø1 | ø6 |
|-------------------------|------|-------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 4.0 |
| Minimum Split (s) | 11.0 | 18.0 |
| Total Split (s) | 14.0 | 76.0 |
| Total Split (%) | 9% | 51% |
| Maximum Green (s) | 8.0 | 70.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | C-Max |
| Walk Time (s) | | 5.0 |
| Flash Dont Walk (s) | | 7.0 |
| Pedestrian Calls (#/hr) | | 0 |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
168: Kings Crossing

PM Peak Hour

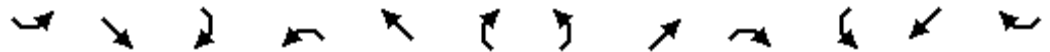


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|----------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| Lane Configurations | | | | | ↑↑ | ↑ | | ↑↑ | | | ↑↑ | |
| Volume (vph) | 0 | 0 | 0 | 31 | 1254 | 273 | 134 | 64 | 0 | 0 | 269 | 47 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 0 | | 0 | 0 | | 150 | 0 | | 0 | 0 | | 0 |
| Storage Lanes | 0 | | 0 | 0 | | 1 | 0 | | 0 | 0 | | 0 |
| Taper Length (ft) | 25 | | | 25 | | | 25 | | | 25 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 |
| Fr _t | | | | | | 0.850 | | | | | 0.976 | |
| Fl _t Protected | | | | | 0.999 | | | 0.968 | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 0 | 3536 | 1583 | 0 | 3426 | 0 | 0 | 3454 | 0 |
| Fl _t Permitted | | | | | 0.999 | | | 0.968 | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 0 | 3536 | 1583 | 0 | 3426 | 0 | 0 | 3454 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | | | | 138 | | | | | | 12 |
| Link Speed (mph) | | 40 | | | 40 | | | 30 | | | | 30 |
| Link Distance (ft) | | 963 | | | 931 | | | 270 | | | | 813 |
| Travel Time (s) | | 16.4 | | | 15.9 | | | 6.1 | | | | 18.5 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.78 | 0.96 | 0.95 | 0.84 | 0.80 | 0.92 | 0.92 | 0.76 | 0.69 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 45 | 1476 | 325 | 180 | 90 | 0 | 0 | 400 | 77 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 1521 | 325 | 0 | 270 | 0 | 0 | 477 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 16 | | | 16 | | | 16 | | | 16 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Number of Detectors | | | | 1 | 2 | 1 | 1 | 2 | | | | 2 |
| Detector Template | | | | Left | Thru | Right | Left | Thru | | | | Thru |
| Leading Detector (ft) | | | | 20 | 100 | 20 | 20 | 100 | | | | 100 |
| Trailing Detector (ft) | | | | 0 | 0 | 0 | 0 | 0 | | | | 0 |
| Detector 1 Position(ft) | | | | 0 | 0 | 0 | 0 | 0 | | | | 0 |
| Detector 1 Size(ft) | | | | 20 | 6 | 20 | 20 | 6 | | | | 6 |
| Detector 1 Type | | | | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | Cl+Ex | | | | Cl+Ex |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 |
| Detector 1 Queue (s) | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 |
| Detector 1 Delay (s) | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 |
| Detector 2 Position(ft) | | | | | 94 | | | 94 | | | | 94 |
| Detector 2 Size(ft) | | | | | 6 | | | 6 | | | | 6 |
| Detector 2 Type | | | | | Cl+Ex | | | Cl+Ex | | | | Cl+Ex |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | | 0.0 | | | 0.0 | | | | 0.0 |
| Turn Type | | | | Prot | NA | Perm | Prot | NA | | | | NA |
| Protected Phases | | | | 15 | 2 | | 14 | 4 | | | | 8 |
| Permitted Phases | | | | | | 2 | | | | | | |

| Lane Group | ø1 | ø6 |
|----------------------------|----|----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphpl) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 1 | 6 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
168: Kings Crossing

PM Peak Hour

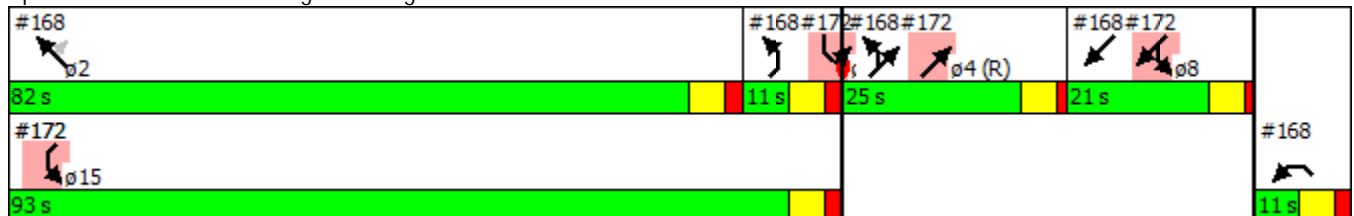


| Lane Group | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|-------------------------|-----|-----|-----|------|-------|-------|-----|-------|-----|-----|-------|-----|
| Detector Phase | | | | 15 | 2 | 2 | 1 4 | 4 | | | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | | | 5.0 | 4.0 | 4.0 | | 5.0 | | | 5.0 | |
| Minimum Split (s) | | | | 11.0 | 17.0 | 17.0 | | 21.0 | | | 21.0 | |
| Total Split (s) | | | | 11.0 | 82.0 | 82.0 | | 25.0 | | | 21.0 | |
| Total Split (%) | | | | 7.3% | 54.7% | 54.7% | | 16.7% | | | 14.0% | |
| Maximum Green (s) | | | | 5.0 | 76.0 | 76.0 | | 20.0 | | | 16.0 | |
| Yellow Time (s) | | | | 4.0 | 4.0 | 4.0 | | 4.0 | | | 4.0 | |
| All-Red Time (s) | | | | 2.0 | 2.0 | 2.0 | | 1.0 | | | 1.0 | |
| Lost Time Adjust (s) | | | | | 0.0 | 0.0 | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | | | | 6.0 | 6.0 | | 5.0 | | | 5.0 | |
| Lead/Lag | | | | | Lead | Lead | | Lead | | | Lag | |
| Lead-Lag Optimize? | | | | | Yes | Yes | | Yes | | | Yes | |
| Vehicle Extension (s) | | | | 3.0 | 3.0 | 3.0 | | 3.0 | | | 3.0 | |
| Recall Mode | | | | None | Max | Max | | C-Max | | | None | |
| Walk Time (s) | | | | | 4.0 | 4.0 | | 5.0 | | | 4.0 | |
| Flash Dont Walk (s) | | | | | 7.0 | 7.0 | | 11.0 | | | 12.0 | |
| Pedestrian Calls (#/hr) | | | | | 0 | 0 | | 0 | | | 0 | |
| Act Effct Green (s) | | | | | 98.0 | 98.0 | | 20.0 | | | 16.0 | |
| Actuated g/C Ratio | | | | | 0.65 | 0.65 | | 0.13 | | | 0.11 | |
| v/c Ratio | | | | | 1.34 | 0.30 | | 0.59 | | | 1.26 | |
| Control Delay | | | | | 185.4 | 6.8 | | 24.8 | | | 186.7 | |
| Queue Delay | | | | | 0.0 | 0.0 | | 0.4 | | | 4.2 | |
| Total Delay | | | | | 185.4 | 6.8 | | 25.2 | | | 190.8 | |
| LOS | | | | | F | A | | C | | | F | |
| Approach Delay | | | | | 154.0 | | | 25.2 | | | 190.8 | |
| Approach LOS | | | | | F | | | C | | | F | |

Intersection Summary

| | |
|------------------------------------|--|
| Area Type: | Other |
| Cycle Length: | 150 |
| Actuated Cycle Length: | 150 |
| Offset: | 35 (23%), Referenced to phase 4:NETL, Start of Green |
| Natural Cycle: | 145 |
| Control Type: | Actuated-Coordinated |
| Maximum v/c Ratio: | 1.81 |
| Intersection Signal Delay: | 147.3 |
| Intersection LOS: | F |
| Intersection Capacity Utilization: | 72.0% |
| ICU Level of Service: | C |
| Analysis Period (min): | 15 |









Splits and Phases: 168: Kings Crossing



| Lane Group | ø1 | ø6 |
|-------------------------|------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 5.0 | 4.0 |
| Minimum Split (s) | 11.0 | 17.0 |
| Total Split (s) | 11.0 | 93.0 |
| Total Split (%) | 7% | 62% |
| Maximum Green (s) | 5.0 | 87.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lag | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | None | Max |
| Walk Time (s) | | 4.0 |
| Flash Dont Walk (s) | | 7.0 |
| Pedestrian Calls (#/hr) | | 0 |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |
















Alternative E: Direct Connector Kingwood to US 59
 171: Lake Houston Parkway

PM Peak Hour

| |  |  |  |  |  |  |
|-----------------------------------|---|---|---|---|---|---|
| Lane Group | NBL | NBT | SBT | SBR | SEL | SER |
| Lane Configurations | |  | | | |  |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 0.95 | 1.00 | 1.00 | 1.00 | 0.88 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 3539 | 0 | 0 | 0 | 3278 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 3539 | 0 | 0 | 0 | 3278 |
| Link Speed (mph) | | 40 | 40 | | 40 | |
| Link Distance (ft) | | 568 | 1309 | | 1311 | |
| Travel Time (s) | | 9.7 | 22.3 | | 22.3 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Left | Right | Left | Right |
| Median Width(ft) | | 120 | 120 | | 120 | |
| Link Offset(ft) | | 0 | 0 | | 0 | |
| Crosswalk Width(ft) | | 16 | 16 | | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | | 9 | 15 | 9 |
| Sign Control | | Free | Free | | Free | |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Control Type: | Unsignalized | | | | | |
| Intersection Capacity Utilization | 0.0% | | | ICU Level of Service A | | |
| Analysis Period (min) | 15 | | | | | |

Alternative E: Direct Connector Kingwood to US 59
 172: Kings Crossing & Lake Houston Parkway

PM Peak Hour

| |  |  |  |  |  |  |  |  |  |  |  |  | ø2 |
|----------------------------|---|---|---|---|---|---|--|---|---|---|---|---|----|
| Lane Group | SBL2 | SBL | SBR | NWL | NWR | NEL | NET | NER | SWL | SWT | SWR | | |
| Lane Configurations | |  | | | | |  | | |  | | | |
| Volume (vph) | 50 | 1414 | 33 | 0 | 0 | 0 | 148 | 25 | 248 | 64 | 0 | | |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | | |
| Lane Util. Factor | 0.95 | 0.97 | 0.95 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.95 | 0.95 | 1.00 | | |
| Frt | | 0.996 | | | | | 0.967 | | | | | | |
| Flt Protected | | 0.954 | | | | | | | | 0.964 | | | |
| Satd. Flow (prot) | 0 | 3434 | 0 | 0 | 0 | 0 | 3422 | 0 | 0 | 3412 | 0 | | |
| Flt Permitted | | 0.954 | | | | | | | | 0.964 | | | |
| Satd. Flow (perm) | 0 | 3434 | 0 | 0 | 0 | 0 | 3422 | 0 | 0 | 3412 | 0 | | |
| Right Turn on Red | | | Yes | | | | | Yes | | | Yes | | |
| Satd. Flow (RTOR) | | 95 | | | | | 20 | | | | | | |
| Link Speed (mph) | | 40 | | 40 | | | 30 | | | 30 | | | |
| Link Distance (ft) | | 934 | | 762 | | | 472 | | | 270 | | | |
| Travel Time (s) | | 15.9 | | 13.0 | | | 10.7 | | | 6.1 | | | |
| Peak Hour Factor | 0.73 | 0.86 | 0.69 | 0.92 | 0.92 | 0.92 | 0.88 | 0.52 | 0.80 | 0.64 | 0.92 | | |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | 113% | | |
| Adj. Flow (vph) | 77 | 1858 | 54 | 0 | 0 | 0 | 190 | 54 | 350 | 113 | 0 | | |
| Shared Lane Traffic (%) | | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 1989 | 0 | 0 | 0 | 0 | 244 | 0 | 0 | 463 | 0 | | |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | | |
| Lane Alignment | Left | Left | Right | Left | Right | Left | Left | Right | Left | Left | Right | | |
| Median Width(ft) | | 24 | | 0 | | | 0 | | | 0 | | | |
| Link Offset(ft) | | 0 | | 0 | | | 0 | | | 0 | | | |
| Crosswalk Width(ft) | | 16 | | 16 | | | 16 | | | 16 | | | |
| Two way Left Turn Lane | | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | |
| Turning Speed (mph) | 15 | 15 | 9 | 15 | 9 | 15 | | 9 | 15 | | 9 | | |
| Number of Detectors | 1 | 1 | | | | | 2 | | 1 | 2 | | | |
| Detector Template | Left | Left | | | | | Thru | | Left | Thru | | | |
| Leading Detector (ft) | 20 | 20 | | | | | 100 | | 20 | 100 | | | |
| Trailing Detector (ft) | 0 | 0 | | | | | 0 | | 0 | 0 | | | |
| Detector 1 Position(ft) | 0 | 0 | | | | | 0 | | 0 | 0 | | | |
| Detector 1 Size(ft) | 20 | 20 | | | | | 6 | | 20 | 6 | | | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | | | | Cl+Ex | | Cl+Ex | Cl+Ex | | | |
| Detector 1 Channel | | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | | | | 0.0 | | 0.0 | 0.0 | | | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | | | | 0.0 | | 0.0 | 0.0 | | | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | | | | 0.0 | | 0.0 | 0.0 | | | |
| Detector 2 Position(ft) | | | | | | | 94 | | | 94 | | | |
| Detector 2 Size(ft) | | | | | | | 6 | | | 6 | | | |
| Detector 2 Type | | | | | | | Cl+Ex | | | Cl+Ex | | | |
| Detector 2 Channel | | | | | | | | | | | | | |
| Detector 2 Extend (s) | | | | | | | 0.0 | | | 0.0 | | | |
| Turn Type | Prot | NA | | | | | NA | | Prot | NA | | | |
| Protected Phases | 1 | 6 | | | | | 4 | | 15 8 | 8 | | 2 | |
| Permitted Phases | | | | | | | | | | | | | |
| Detector Phase | 1 | 6 | | | | | 4 | | 15 8 | 8 | | | |
| Switch Phase | | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 4.0 | | | | | 5.0 | | | 5.0 | | 4.0 | |

| | |
|----------------------------|-----|
| Lane Group | ø15 |
| Lane Configurations | |
| Volume (vph) | |
| Ideal Flow (vphpl) | |
| Lane Util. Factor | |
| Frt | |
| Flt Protected | |
| Satd. Flow (prot) | |
| Flt Permitted | |
| Satd. Flow (perm) | |
| Right Turn on Red | |
| Satd. Flow (RTOR) | |
| Link Speed (mph) | |
| Link Distance (ft) | |
| Travel Time (s) | |
| Peak Hour Factor | |
| Growth Factor | |
| Adj. Flow (vph) | |
| Shared Lane Traffic (%) | |
| Lane Group Flow (vph) | |
| Enter Blocked Intersection | |
| Lane Alignment | |
| Median Width(ft) | |
| Link Offset(ft) | |
| Crosswalk Width(ft) | |
| Two way Left Turn Lane | |
| Headway Factor | |
| Turning Speed (mph) | |
| Number of Detectors | |
| Detector Template | |
| Leading Detector (ft) | |
| Trailing Detector (ft) | |
| Detector 1 Position(ft) | |
| Detector 1 Size(ft) | |
| Detector 1 Type | |
| Detector 1 Channel | |
| Detector 1 Extend (s) | |
| Detector 1 Queue (s) | |
| Detector 1 Delay (s) | |
| Detector 2 Position(ft) | |
| Detector 2 Size(ft) | |
| Detector 2 Type | |
| Detector 2 Channel | |
| Detector 2 Extend (s) | |
| Turn Type | |
| Protected Phases | 15 |
| Permitted Phases | |
| Detector Phase | |
| Switch Phase | |
| Minimum Initial (s) | 5.0 |

Alternative E: Direct Connector Kingwood to US 59
 172: Kings Crossing & Lake Houston Parkway

PM Peak Hour

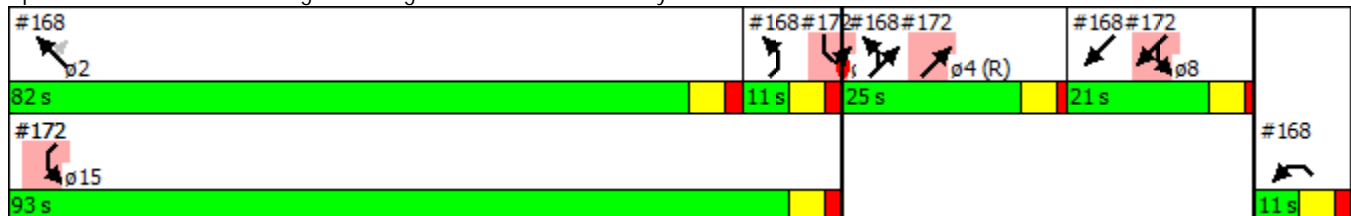


| Lane Group | SBL2 | SBL | SBR | NWL | NWR | NEL | NET | NER | SWL | SWT | SWR | ø2 |
|-------------------------|------|-------|-----|-----|-----|-----|-------|-----|-----|--------|-----|------|
| Minimum Split (s) | 11.0 | 17.0 | | | | | 21.0 | | | 21.0 | | 17.0 |
| Total Split (s) | 11.0 | 93.0 | | | | | 25.0 | | | 21.0 | | 82.0 |
| Total Split (%) | 7.3% | 62.0% | | | | | 16.7% | | | 14.0% | | 55% |
| Maximum Green (s) | 5.0 | 87.0 | | | | | 20.0 | | | 16.0 | | 76.0 |
| Yellow Time (s) | 4.0 | 4.0 | | | | | 4.0 | | | 4.0 | | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | | | | 1.0 | | | 1.0 | | 2.0 |
| Lost Time Adjust (s) | | 0.0 | | | | | 0.0 | | | 0.0 | | |
| Total Lost Time (s) | | 6.0 | | | | | 5.0 | | | 5.0 | | |
| Lead/Lag | Lag | | | | | | Lead | | | Lag | | Lead |
| Lead-Lag Optimize? | Yes | | | | | | Yes | | | Yes | | Yes |
| Vehicle Extension (s) | 3.0 | 3.0 | | | | | 3.0 | | | 3.0 | | 3.0 |
| Recall Mode | None | Max | | | | | C-Max | | | None | | Max |
| Walk Time (s) | | 4.0 | | | | | 5.0 | | | 4.0 | | 4.0 |
| Flash Dont Walk (s) | | 7.0 | | | | | 11.0 | | | 12.0 | | 7.0 |
| Pedestrian Calls (#/hr) | | 0 | | | | | 0 | | | 0 | | 0 |
| Act Effect Green (s) | | 98.0 | | | | | 20.0 | | | 16.0 | | |
| Actuated g/C Ratio | | 0.65 | | | | | 0.13 | | | 0.11 | | |
| v/c Ratio | | 1.81 | | | | | 0.52 | | | 1.86dl | | |
| Control Delay | | 389.4 | | | | | 59.7 | | | 168.9 | | |
| Queue Delay | | 0.0 | | | | | 0.0 | | | 0.1 | | |
| Total Delay | | 389.4 | | | | | 59.7 | | | 169.1 | | |
| LOS | | F | | | | | E | | | F | | |
| Approach Delay | | 389.4 | | | | | 59.7 | | | 169.1 | | |
| Approach LOS | | F | | | | | E | | | F | | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 35 (23%), Referenced to phase 4:NETL, Start of Green
 Natural Cycle: 145
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.81
 Intersection Signal Delay: 321.7 Intersection LOS: F
 Intersection Capacity Utilization 82.7% ICU Level of Service E
 Analysis Period (min) 15
 dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 172: Kings Crossing & Lake Houston Parkway



| | |
|-----------------------------|------|
| Lane Group | ø15 |
| Minimum Split (s) | 11.0 |
| Total Split (s) | 11.0 |
| Total Split (%) | 7% |
| Maximum Green (s) | 5.0 |
| Yellow Time (s) | 4.0 |
| All-Red Time (s) | 2.0 |
| Lost Time Adjust (s) | |
| Total Lost Time (s) | |
| Lead/Lag | |
| Lead-Lag Optimize? | |
| Vehicle Extension (s) | 3.0 |
| Recall Mode | None |
| Walk Time (s) | |
| Flash Dont Walk (s) | |
| Pedestrian Calls (#/hr) | |
| Act Effct Green (s) | |
| Actuated g/C Ratio | |
| v/c Ratio | |
| Control Delay | |
| Queue Delay | |
| Total Delay | |
| LOS | |
| Approach Delay | |
| Approach LOS | |
| Intersection Summary | |

174:

| | ↑ | ↖ | ↙ | ↓ | ↘ | ↗ |
|-----------------------------------|--------------|-------|------|------------------------|------|-------|
| Lane Group | NBT | NBR | SBL | SBT | NWL | NWR |
| Lane Configurations | | | | ↑↑ | | ↗↗ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 0.88 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Link Speed (mph) | 40 | | | 40 | 30 | |
| Link Distance (ft) | 610 | | | 450 | 549 | |
| Travel Time (s) | 10.4 | | | 7.7 | 12.5 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 80 | | | 80 | 80 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | | 15 | 15 | | 9 |
| Sign Control | Free | | | Free | Free | |
| Intersection Summary | | | | | | |
| Area Type: | Other | | | | | |
| Control Type: | Unsignalized | | | | | |
| Intersection Capacity Utilization | 0.0% | | | ICU Level of Service A | | |
| Analysis Period (min) | 15 | | | | | |

| Lane Group | ø2 | ø15 |
|----------------------------|----|-----|
| Lane Configurations | | |
| Volume (vph) | | |
| Ideal Flow (vphp) | | |
| Storage Length (ft) | | |
| Storage Lanes | | |
| Taper Length (ft) | | |
| Lane Util. Factor | | |
| Frt | | |
| Flt Protected | | |
| Satd. Flow (prot) | | |
| Flt Permitted | | |
| Satd. Flow (perm) | | |
| Right Turn on Red | | |
| Satd. Flow (RTOR) | | |
| Link Speed (mph) | | |
| Link Distance (ft) | | |
| Travel Time (s) | | |
| Peak Hour Factor | | |
| Growth Factor | | |
| Adj. Flow (vph) | | |
| Shared Lane Traffic (%) | | |
| Lane Group Flow (vph) | | |
| Enter Blocked Intersection | | |
| Lane Alignment | | |
| Median Width(ft) | | |
| Link Offset(ft) | | |
| Crosswalk Width(ft) | | |
| Two way Left Turn Lane | | |
| Headway Factor | | |
| Turning Speed (mph) | | |
| Number of Detectors | | |
| Detector Template | | |
| Leading Detector (ft) | | |
| Trailing Detector (ft) | | |
| Detector 1 Position(ft) | | |
| Detector 1 Size(ft) | | |
| Detector 1 Type | | |
| Detector 1 Channel | | |
| Detector 1 Extend (s) | | |
| Detector 1 Queue (s) | | |
| Detector 1 Delay (s) | | |
| Detector 2 Position(ft) | | |
| Detector 2 Size(ft) | | |
| Detector 2 Type | | |
| Detector 2 Channel | | |
| Detector 2 Extend (s) | | |
| Turn Type | | |
| Protected Phases | 2 | 15 |
| Permitted Phases | | |

Alternative E: Direct Connector Kingwood to US 59
175: Rustic Woods

PM Peak Hour

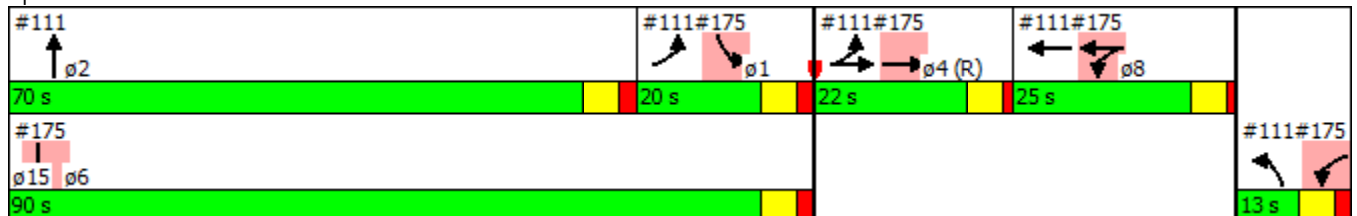


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-----|-------|-----|-----|-------|-----|-----|-----|-----|-------|-------|-----|
| Detector Phase | | 4 | | 15 | 8 | | | | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | | 5.0 | | | 5.0 | | | | | 5.0 | 4.0 | |
| Minimum Split (s) | | 21.0 | | | 25.0 | | | | | 20.0 | 21.0 | |
| Total Split (s) | | 22.0 | | | 25.0 | | | | | 20.0 | 90.0 | |
| Total Split (%) | | 14.7% | | | 16.7% | | | | | 13.3% | 60.0% | |
| Maximum Green (s) | | 17.0 | | | 20.0 | | | | | 14.0 | 84.0 | |
| Yellow Time (s) | | 4.0 | | | 4.0 | | | | | 4.0 | 4.0 | |
| All-Red Time (s) | | 1.0 | | | 1.0 | | | | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | | | 0.0 | 0.0 | |
| Total Lost Time (s) | | 5.0 | | | 5.0 | | | | | 6.0 | 6.0 | |
| Lead/Lag | | Lead | | | Lag | | | | | Lag | | |
| Lead-Lag Optimize? | | Yes | | | Yes | | | | | Yes | | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | | | | 3.0 | 3.0 | |
| Recall Mode | | C-Max | | | None | | | | | None | Max | |
| Walk Time (s) | | 5.0 | | | 5.0 | | | | | | | |
| Flash Dont Walk (s) | | 11.0 | | | 14.0 | | | | | | | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | | | | | |
| Act Effct Green (s) | | 17.0 | | | 33.0 | | | | | 12.6 | 84.0 | |
| Actuated g/C Ratio | | 0.11 | | | 0.22 | | | | | 0.08 | 0.56 | |
| v/c Ratio | | 0.49 | | | 0.36 | | | | | 0.46 | 0.67 | |
| Control Delay | | 27.6 | | | 20.1 | | | | | 75.1 | 25.2 | |
| Queue Delay | | 0.1 | | | 6.9 | | | | | 0.0 | 0.0 | |
| Total Delay | | 27.7 | | | 27.0 | | | | | 75.1 | 25.2 | |
| LOS | | C | | | C | | | | | E | C | |
| Approach Delay | | 27.7 | | | 27.0 | | | | | | 27.7 | |
| Approach LOS | | C | | | C | | | | | | C | |

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 20 (13%), Referenced to phase 4:EBTL, Start of Green
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 27.6
 Intersection LOS: C
 Intersection Capacity Utilization 59.1%
 ICU Level of Service B
 Analysis Period (min) 15

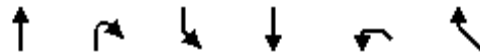
Splits and Phases: 175: Rustic Woods



| Lane Group | ø2 | ø15 |
|-------------------------|------|------|
| Detector Phase | | |
| Switch Phase | | |
| Minimum Initial (s) | 4.0 | 5.0 |
| Minimum Split (s) | 21.0 | 11.0 |
| Total Split (s) | 70.0 | 13.0 |
| Total Split (%) | 47% | 9% |
| Maximum Green (s) | 64.0 | 7.0 |
| Yellow Time (s) | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 |
| Lost Time Adjust (s) | | |
| Total Lost Time (s) | | |
| Lead/Lag | Lead | |
| Lead-Lag Optimize? | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 |
| Recall Mode | Max | None |
| Walk Time (s) | 5.0 | |
| Flash Dont Walk (s) | 6.0 | |
| Pedestrian Calls (#/hr) | 0 | |
| Act Effct Green (s) | | |
| Actuated g/C Ratio | | |
| v/c Ratio | | |
| Control Delay | | |
| Queue Delay | | |
| Total Delay | | |
| LOS | | |
| Approach Delay | | |
| Approach LOS | | |
| Intersection Summary | | |

Alternative E: Direct Connector Kingwood to US 59
 178: Lake Houston Parkway & Lake Houston Pkwy

PM Peak Hour



| Lane Group | NBT | NBR | SBL | SBT | NWL | NWR |
|----------------------------|------|-------|------|------|------|-------|
| Lane Configurations | | | | ↑↑ | | ↑↑ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 0.88 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Link Speed (mph) | 40 | | | 40 | 40 | |
| Link Distance (ft) | 3424 | | | 1043 | 3971 | |
| Travel Time (s) | 58.4 | | | 17.8 | 67.7 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 60 | | | 60 | 60 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | | 15 | 15 | | 9 |
| Sign Control | Stop | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|-----------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% ICU Level of Service A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
185: Hamblen

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|----------------------------|-------|-------|-------|------|------|-------|
| Lane Configurations | | | | | | |
| Volume (vph) | 99 | 8 | 111 | 123 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | | 0 | 150 | | 0 | 0 |
| Storage Lanes | | 0 | 1 | | 1 | 0 |
| Taper Length (ft) | | | 25 | | 25 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | 0.990 | | | | | |
| Flt Protected | | | 0.950 | | | |
| Satd. Flow (prot) | 1844 | 0 | 1770 | 1863 | 1863 | 0 |
| Flt Permitted | | | 0.950 | | | |
| Satd. Flow (perm) | 1844 | 0 | 1770 | 1863 | 1863 | 0 |
| Link Speed (mph) | 30 | | | 30 | 30 | |
| Link Distance (ft) | 123 | | | 358 | 309 | |
| Travel Time (s) | 2.8 | | | 8.1 | 7.0 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 122 | 10 | 136 | 151 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 132 | 0 | 136 | 151 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 12 | | | 12 | 12 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | | 9 | 15 | | 15 | 9 |
| Sign Control | Free | | | Free | Stop | |

Intersection Summary

| | |
|-----------------------------------|--------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 20.1% |
| ICU Level of Service | A |
| Analysis Period (min) | 15 |

Alternative E: Direct Connector Kingwood to US 59
188: Sorters

PM Peak Hour



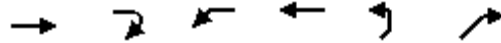
| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|----------------------------|------|-------|-------|-------|------|------|
| Lane Configurations | | | ↔ | | | ↑ |
| Volume (vph) | 0 | 0 | 326 | 41 | 0 | 163 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | | 0.981 | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 1827 | 0 | 0 | 1863 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 1827 | 0 | 0 | 1863 |
| Link Speed (mph) | 40 | | 35 | | | 30 |
| Link Distance (ft) | 1484 | | 5784 | | | 70 |
| Travel Time (s) | 25.3 | | 112.7 | | | 1.6 |
| Peak Hour Factor | 0.92 | 0.92 | 0.82 | 0.64 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 449 | 72 | 0 | 200 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 521 | 0 | 0 | 200 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Right | Left | Left |
| Median Width(ft) | 0 | | 0 | | | 0 |
| Link Offset(ft) | 0 | | 0 | | | 0 |
| Crosswalk Width(ft) | 16 | | 16 | | | 16 |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | 9 | | 9 | 15 | |
| Sign Control | Stop | | Free | | | Free |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 25.5% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |

Alternative E: Direct Connector Kingwood to US 59
189: Northpark Dr.

PM Peak Hour



| Lane Group | EBT | EBR | WBL | WBT | NEL | NER |
|----------------------------|------|-------|------|------|------|-------|
| Lane Configurations | | | | ↑↑ | | ↑↑ |
| Volume (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 0.88 |
| Frt | | | | | | |
| Flt Protected | | | | | | |
| Satd. Flow (prot) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Flt Permitted | | | | | | |
| Satd. Flow (perm) | 0 | 0 | 0 | 3539 | 0 | 3278 |
| Link Speed (mph) | 40 | | | 40 | 40 | |
| Link Distance (ft) | 1488 | | | 3872 | 1484 | |
| Travel Time (s) | 25.4 | | | 66.0 | 25.3 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 113% | 113% | 113% | 113% | 113% | 113% |
| Adj. Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No |
| Lane Alignment | Left | Right | Left | Left | Left | Right |
| Median Width(ft) | 0 | | | 30 | 50 | |
| Link Offset(ft) | 0 | | | 0 | 0 | |
| Crosswalk Width(ft) | 16 | | | 16 | 16 | |
| Two way Left Turn Lane | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 9 | | 15 | | 9 | |
| Sign Control | Free | | | Free | Free | |

Intersection Summary

| | |
|-----------------------------------|------------------------|
| Area Type: | Other |
| Control Type: | Unsignalized |
| Intersection Capacity Utilization | 0.0% |
| Analysis Period (min) | 15 |
| | ICU Level of Service A |