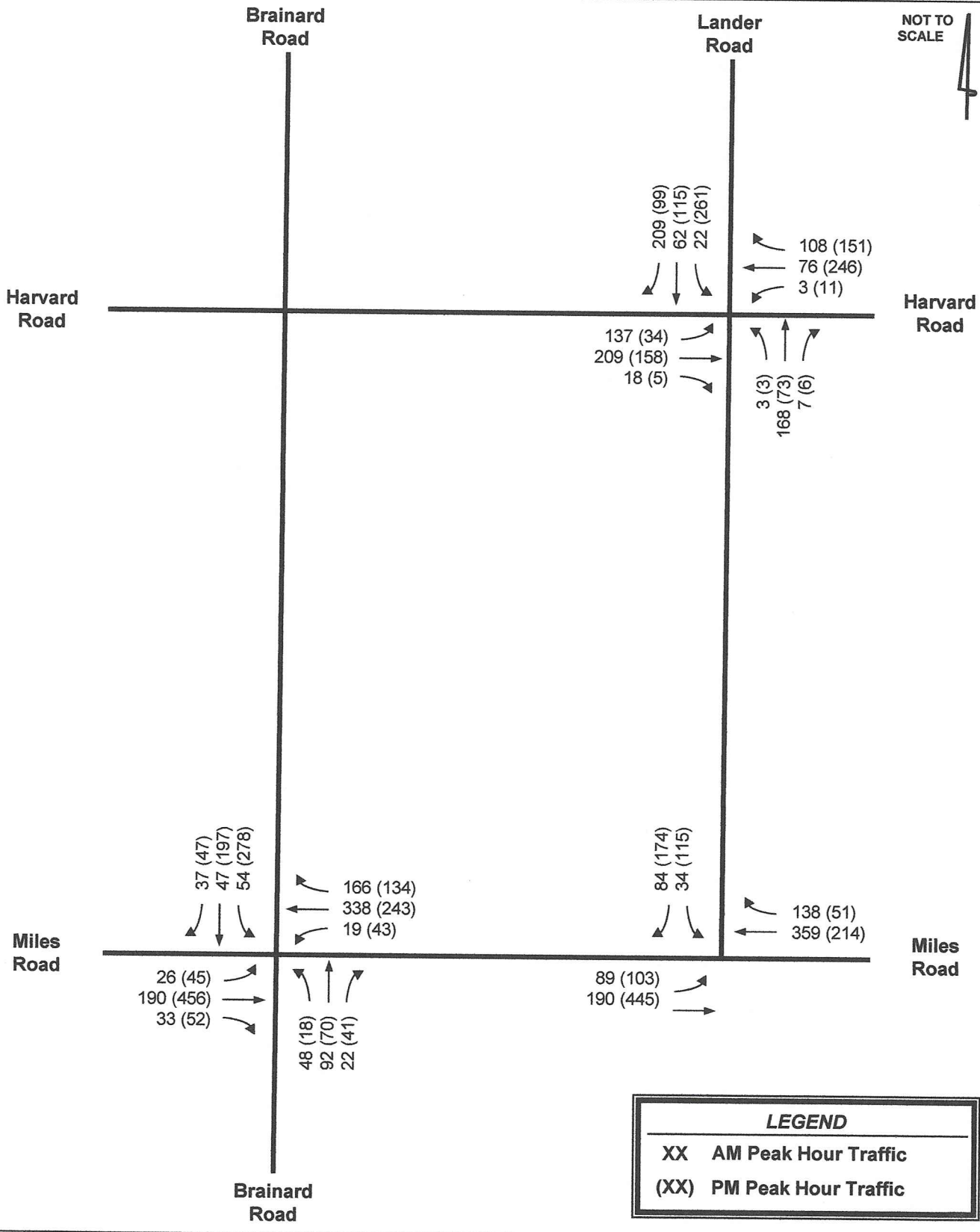
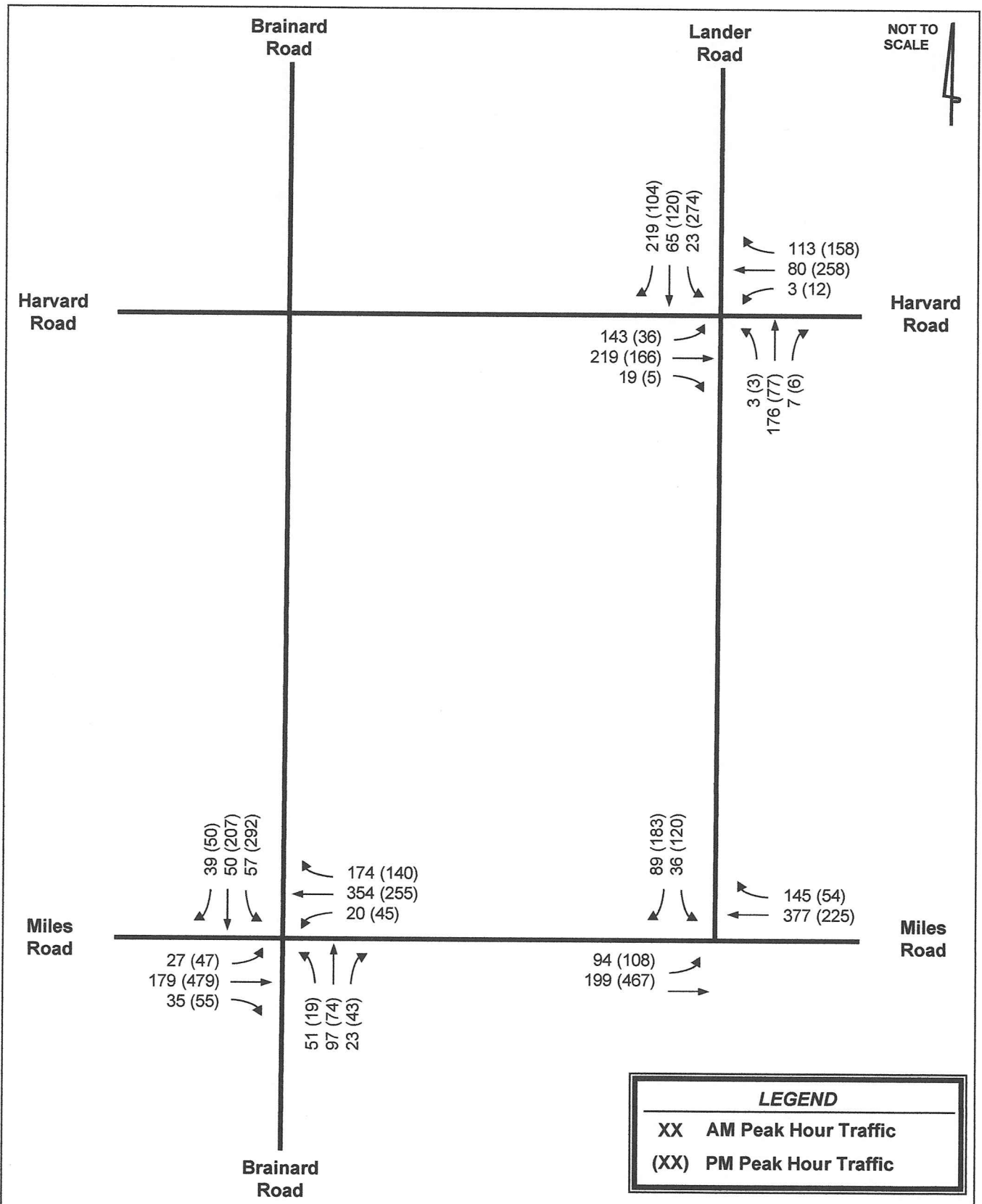
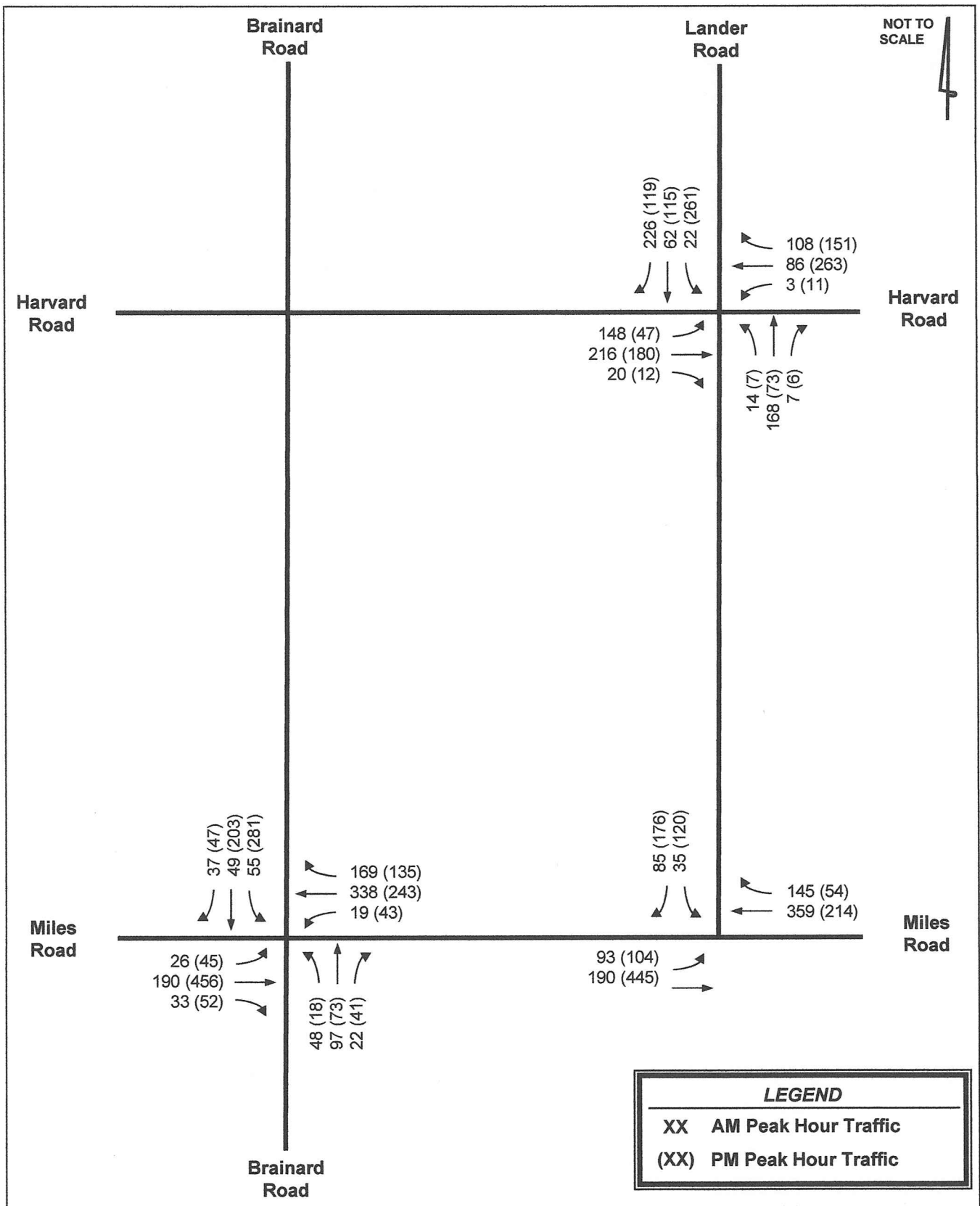
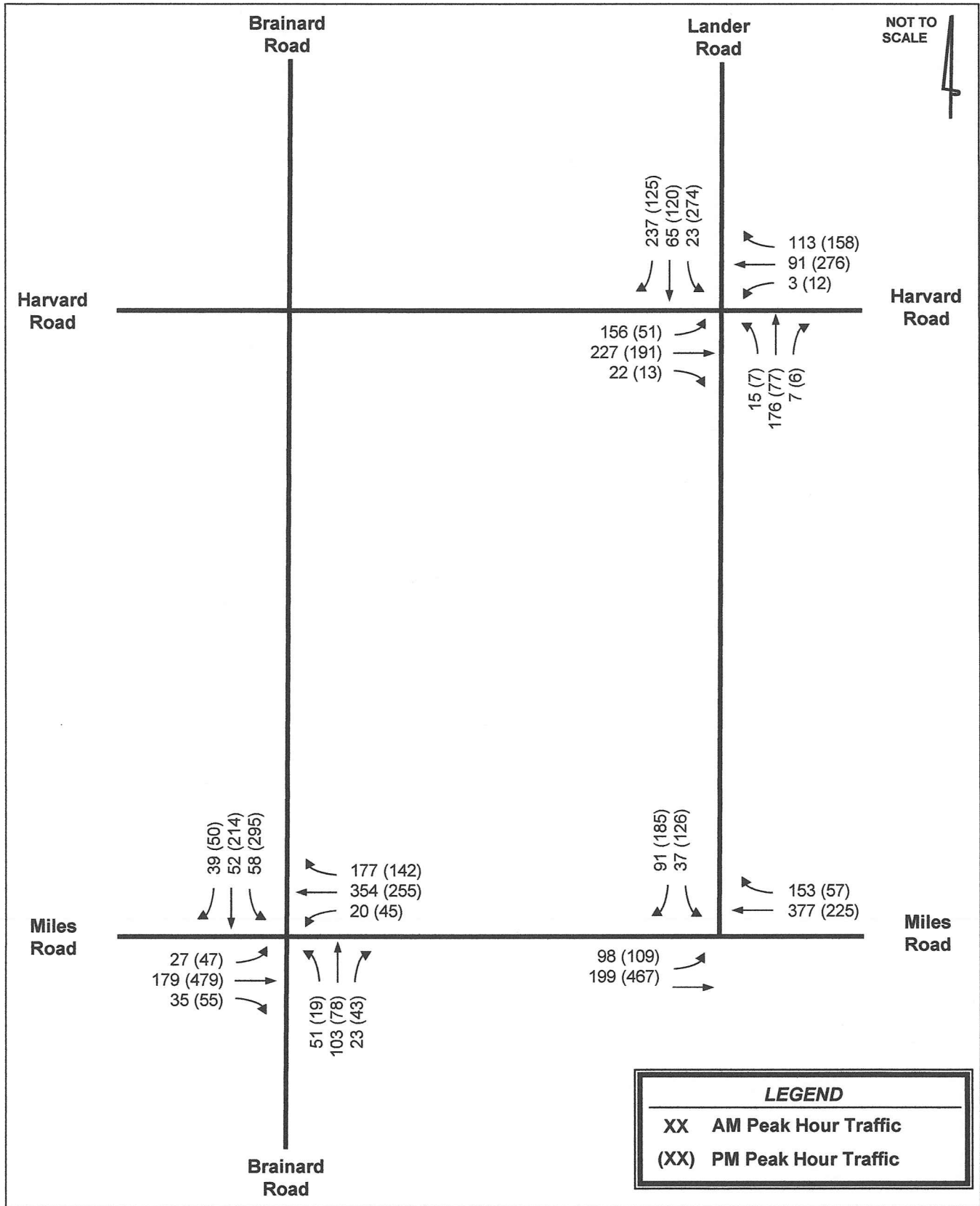


NOT TO SCALE







VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: Village of Orange At Intersection of Miles Road and Braithard Road

Date: 7/16/2013 Day: Tue. Comments: _____ Project: 13-094
 Weather: Clear Recorder(s): DHC Date entry by: JUO Date entered: Jul. 17, 2013 Miles Rd. x Braithard Rd 071613

| TIME BEGINS | Braithard Rd. FROM NORTH | | | | | | Braithard Rd. FROM SOUTH | | | | | | TOTAL NORTH SOUTH | | Miles Rd. FROM EAST | | | | | | Miles Rd. FROM WEST | | | | | | TOTAL EAST WEST | | | TOTAL ALL DIREC. | | | PEAK HOUR FACTOR | | | | | | | |
|---------------|--------------------------|------|------|------|------|------|--------------------------|-----|------|------|------|------|-------------------|-----|---------------------|-------|------|------|------|------|---------------------|-------|-----|------|-------|------|-----------------|-------|-------|------------------|-------|-------|------------------|------|------|-----|------|-----|------|-----|
| | Right | | Left | | Bus | | Right | | Left | | Bus | | Total | Trk | Bus | Right | | Left | | Bus | | Total | Trk | Bus | Total | Trk | Bus | Total | Trk | Bus | North | South | East | West | | | | | | |
| | Thru | Trk | Thru | Trk | Thru | Trk | Thru | Trk | Thru | Trk | Thru | Trk | | | | Thru | Trk | Thru | Trk | Thru | Trk | | | | | | | | | | | | | | Thru | Trk | Thru | Trk | Thru | Trk |
| 06:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 07:00 | 53 | 42 | 27 | 122 | 2 | 0 | 45 | 10 | 111 | 2 | 0 | 233 | | | 16 | 326 | 126 | 468 | 7 | 0 | 16 | 151 | 22 | 189 | 10 | 0 | 657 | 890 | 0.726 | 0.694 | 0.842 | 0.815 | | | | | | | | |
| 08:00 | 54 | 47 | 37 | 138 | 4 | 0 | 48 | 22 | 162 | 10 | 0 | 300 | | | 19 | 336 | 165 | 520 | 10 | 0 | 26 | 189 | 33 | 248 | 24 | 0 | 768 | 1068 | 0.802 | 0.964 | 0.897 | 0.899 | | | | | | | | |
| 09:00 | 73 | 33 | 49 | 155 | 7 | 0 | 26 | 18 | 95 | 3 | 0 | 250 | | | 20 | 279 | 125 | 424 | 23 | 1 | 21 | 230 | 25 | 276 | 32 | 0 | 700 | 950 | 0.881 | 0.880 | 0.869 | 0.873 | | | | | | | | |
| 10:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11:00 | 90 | 37 | 27 | 154 | 2 | 1 | 23 | 21 | 80 | 2 | 1 | 224 | | | 21 | 222 | 93 | 336 | 15 | 0 | 32 | 244 | 19 | 295 | 16 | 0 | 631 | 865 | 0.875 | 0.833 | 0.903 | 0.776 | | | | | | | | |
| 12:00 | 116 | 37 | 33 | 186 | 4 | 0 | 20 | 40 | 99 | 3 | 0 | 285 | | | 28 | 290 | 123 | 441 | 22 | 0 | 36 | 309 | 28 | 373 | 22 | 0 | 814 | 1099 | 0.845 | 0.917 | 0.875 | 0.833 | | | | | | | | |
| 1:00 | 122 | 54 | 42 | 218 | 4 | 0 | 24 | 28 | 86 | 1 | 0 | 304 | | | 35 | 275 | 108 | 418 | 18 | 1 | 35 | 276 | 32 | 343 | 17 | 0 | 761 | 1065 | 0.801 | 0.935 | 0.836 | 0.903 | | | | | | | | |
| 2:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3:00 | 146 | 67 | 31 | 244 | 4 | 0 | 20 | 58 | 111 | 6 | 0 | 355 | | | 31 | 237 | 113 | 381 | 19 | 0 | 25 | 309 | 39 | 373 | 7 | 0 | 754 | 1109 | 0.897 | 0.816 | 0.916 | 0.777 | | | | | | | | |
| 4:00 | 221 | 148 | 27 | 396 | 6 | 1 | 25 | 60 | 109 | 1 | 1 | 505 | | | 35 | 289 | 148 | 472 | 13 | 1 | 44 | 378 | 43 | 465 | 7 | 0 | 937 | 1442 | 0.832 | 0.879 | 0.908 | 0.908 | | | | | | | | |
| 5:00 | 277 | 196 | 47 | 520 | 6 | 0 | 18 | 70 | 129 | 0 | 0 | 649 | | | 43 | 242 | 133 | 418 | 7 | 0 | 45 | 454 | 52 | 551 | 5 | 0 | 969 | 1618 | 0.909 | 0.827 | 0.886 | 0.918 | | | | | | | | |
| 6:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS | 1152 | 661 | 320 | 2133 | 33 | 2 | 249 | 496 | 982 | 28 | 2 | 3115 | | | 248 | 2496 | 1134 | 3878 | 134 | 3 | 280 | 2540 | 293 | 3113 | 140 | 0 | 6991 | 10106 | | | | | | | | | | | | |
| ADT | 1760 | 1010 | 480 | 3258 | 1.6% | 1.6% | 360 | 758 | 1500 | 3.1% | 3.1% | 4758 | | | 379 | 3813 | 1732 | 5924 | 3.5% | 3.5% | 428 | 3880 | 448 | 4755 | 4.5% | 4.5% | 10679 | 15437 | | | | | | | | | | | | |

HOURLY FACTOR: 1.69 MONTHLY FACTOR: 0.91 COMBINED FACTOR: 1.53

TMS ENGINEERS, INC.
 4547 Hudson Drive
 Steer, Ohio 44224
 (330) 656-6402 FAX: (330) 656-6417

Figure #:
Page #:

VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: Village of Orange At Intersection of Harvard Road and Lander Road
 Date: 7/18/2013 Day: Thu. Comments: _____ Project: 13-094
 Weather: Clear Recorder(s): RJS Date entry by: JLD Date entered: Jul. 19, 2013 Harvard Rd a Lander R4.071813

| TIME BEGINS | Harvard Rd. FROM NORTH | | | | Harvard Rd. FROM SOUTH | | | | Lander Rd. FROM EAST | | | | Lander Rd. FROM WEST | | | | TOTAL EAST WEST | TOTAL ALL DIREC. | PEAK HOUR FACTOR | | | | | | | | | | | | | | | |
|-------------|------------------------|------|-------|-------|------------------------|-----|------|------|----------------------|-------|------|-----|----------------------|------|-------|-------|-----------------|------------------|------------------|-----|-------|-------|------|------|-----|------|-------|-------|-------|-------|-------|--|--|--|
| | Left | Thru | Right | Total | Trk | Bus | Left | Thru | Right | Total | Trk | Bus | Left | Thru | Right | Total | | | Trk | Bus | North | South | East | West | | | | | | | | | | |
| 06:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 07:00 | 110 | 17 | 14 | 141 | 1 | 0 | 5 | 138 | 4 | 147 | 0 | 0 | 6 | 40 | 72 | 118 | 0 | 0 | 0 | 79 | 122 | 3 | 204 | 3 | 0 | 322 | 610 | 0.719 | 0.782 | 0.686 | 0.586 | | | |
| 08:00 | 208 | 62 | 22 | 292 | 5 | 0 | 3 | 167 | 7 | 177 | 1 | 1 | 3 | 76 | 107 | 186 | 0 | 1 | 1 | 136 | 208 | 18 | 362 | 5 | 1 | 548 | 1017 | 0.785 | 0.903 | 0.715 | 0.838 | | | |
| 09:00 | 169 | 50 | 29 | 248 | 7 | 3 | 7 | 166 | 45 | 220 | 3 | 1 | 21 | 132 | 93 | 246 | 4 | 0 | 0 | 65 | 165 | 7 | 237 | 4 | 2 | 483 | 951 | 0.805 | 0.505 | 0.842 | 0.731 | | | |
| 10:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11:00 | 127 | 35 | 25 | 187 | 8 | 0 | 5 | 77 | 11 | 93 | 4 | 0 | 17 | 100 | 96 | 213 | 3 | 1 | 32 | 137 | 2 | 171 | 4 | 0 | 384 | 664 | 0.806 | 0.775 | 0.954 | 0.872 | | | | |
| 12:00 | 182 | 61 | 40 | 283 | 3 | 2 | 4 | 71 | 12 | 87 | 4 | 0 | 12 | 128 | 103 | 243 | 5 | 1 | 51 | 146 | 0 | 197 | 2 | 0 | 440 | 810 | 0.786 | 0.837 | 0.935 | 0.966 | | | | |
| 1:00 | 196 | 52 | 44 | 292 | 2 | 0 | 3 | 97 | 10 | 110 | 3 | 1 | 15 | 141 | 115 | 271 | 0 | 1 | 45 | 137 | 8 | 190 | 3 | 0 | 461 | 863 | 0.859 | 0.833 | 0.869 | 0.792 | | | | |
| 2:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3:00 | 200 | 60 | 48 | 308 | 3 | 0 | 6 | 84 | 19 | 109 | 5 | 1 | 19 | 154 | 103 | 276 | 3 | 0 | 41 | 142 | 5 | 188 | 6 | 1 | 464 | 881 | 0.885 | 0.779 | 0.873 | 0.870 | | | | |
| 4:00 | 242 | 94 | 57 | 393 | 4 | 0 | 7 | 94 | 27 | 128 | 0 | 0 | 14 | 181 | 120 | 315 | 1 | 0 | 39 | 126 | 7 | 172 | 1 | 0 | 487 | 1008 | 0.862 | 0.542 | 0.926 | 0.915 | | | | |
| 5:00 | 260 | 114 | 99 | 473 | 2 | 0 | 3 | 73 | 6 | 82 | 1 | 0 | 11 | 245 | 150 | 406 | 3 | 0 | 34 | 157 | 5 | 196 | 1 | 0 | 602 | 1157 | 0.924 | 0.820 | 0.839 | 0.875 | | | | |
| 6:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9:00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTALS | 1694 | 545 | 378 | 2617 | 35 | 5 | 43 | 969 | 141 | 1153 | 21 | 4 | 3770 | 118 | 1197 | 959 | 2274 | 19 | 4 | 522 | 1340 | 55 | 1917 | 32 | 4 | 4191 | 7961 | | | | | | | |
| ADT | 2456 | 790 | 548 | 3795 | 1.5% | | 62 | 1405 | 204 | 1672 | 2.2% | | 5466 | 171 | 1736 | 1391 | 3297 | 1.0% | | 757 | 1943 | 80 | 2780 | 1.9% | | 6077 | 11543 | | | | | | | |

HOURLY FACTOR: 1.69 MONTHLY FACTOR: 0.86 COMBINED FACTOR: 1.45

TMS ENGINEERS, INC.
 4547 Hudson Drive
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Figure #: _____
 Page #: _____

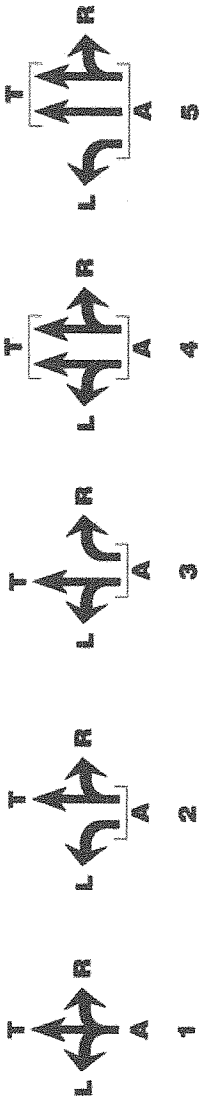
RIGHT TURN FACTORIZATION SHEET

Intersections: Harvard Road & Lander Road
 Municipality: Orange Village, OH
 Conditions: 2015 No Build
 County: Cuyahoga

| DIR | HOUR BEGIN | MINOR STREET | | | ADJUSTED MINOR STREET VOLUMES | ADJUSTED RIGHT TURNS | ADJUSTED RIGHT TURN REDUCTION % | MAINLINE CONGESTION FACTOR % | BASE RIGHT TURN REDUCTION % | MAINLINE APPROACH VOLUME PER LANE | THRU T | RIGHT R | TOTAL A | 0.7A | 0.35A | 3T | T/3 | (T+L) | (T+R) | 3R | 3L | T/2 | T/4 | BASE REDUCTION |
|-----|------------|--------------|------|-------|-------------------------------|----------------------|---------------------------------|------------------------------|-----------------------------|-----------------------------------|--------|---------|---------|------|-------|----|-----|-------|-------|-----|----|-----|-----|----------------|
| | | LEFT | THRU | RIGHT | | | | | | | | | | | | | | | | | | | | |
| | | L | T | R | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4TH | 236 | 104 | 89 | 411 | 71 | 0% | 0% | 20% | 343 | 104 | 429 | 300 | 150 | 312 | 35 | 340 | 193 | 267 | 706 | 52 | 26 | 20% | |
| | 8TH | 492 | 84 | 72 | 347 | 58 | 0% | 0% | 20% | 299 | 84 | 347 | 243 | 121 | 252 | 28 | 275 | 156 | 216 | 573 | 42 | 21 | 20% | |

| Volume | Factor (%) |
|-----------|------------|
| 0-399 | 0% |
| 400-499 | 5% |
| 500-599 | 10% |
| 600-699 | 15% |
| 700-799 | 20% |
| 800-899 | 25% |
| 900-999 | 30% |
| 1000-1099 | 35% |
| 1100-1199 | 40% |
| 1200-1299 | 45% |
| 1300-1399 | 50% |
| 1400-1499 | 55% |

LANE CONFIGURATIONS



Any Configuration with any exclusive right turn lane

REVIEW INFORMATION
 Counts Used: _____
 Count Dated: _____
 Date Reviewed: _____
 Reviewed By: _____

TRAFFIC SIGNAL WARRANT SUMMARY

City: Orange Village Engineer: ABC
 County: Cuyahoga Date: March 14, 2013
 Major Street: Harvard Road Lanes: 1 Critical Approach Speed: 35
 Minor Street: Lander Road Lanes: 1

Volume Level Criteria

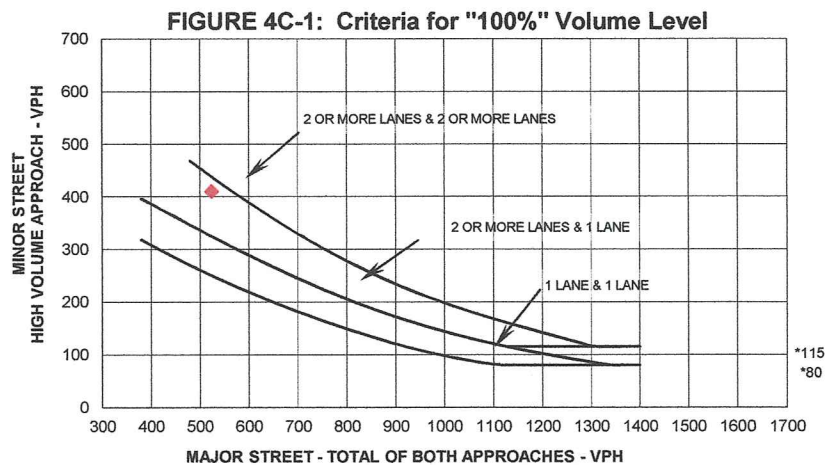
1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? Yes No
 2. Is the intersection in a built-up area of isolated community of <10,000 population? Yes No
- If Question 1 or 2 above is answered "Yes", then use "70%" volume level 70% 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

If all four points lie above the appropriate line, then the warrant is satisfied.

Applicable: Yes No
 Satisfied: Yes No

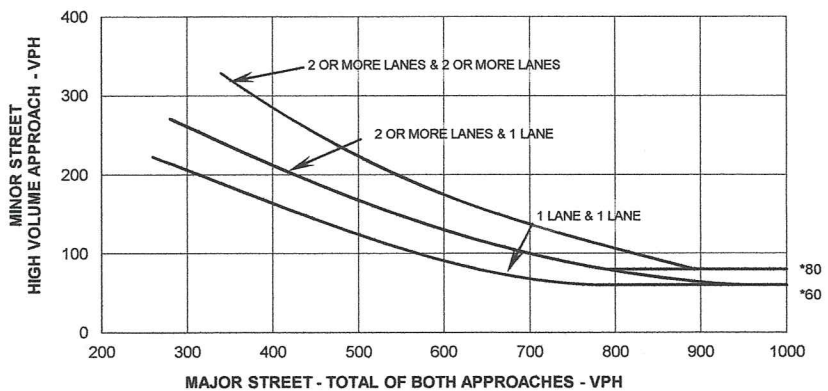
Plot four volume combinations on the applicable figure below.



* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

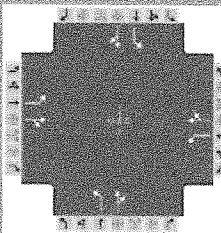
| Four Highest Hours | Volumes | |
|--------------------|--------------|--------------|
| | Major Street | Minor Street |
| 4th Highest | 523 | 411 |
| | | |
| | | |

FIGURE 4C-2: Criteria for "70%" Volume Level
 (Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)

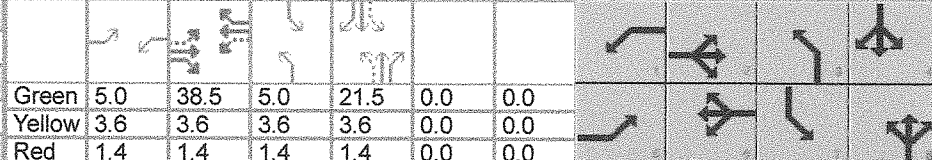


* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

HCS 2010 Signalized Intersection Results Summary

| General Information | | | | | Intersection Information | | | | |  | | |
|---------------------|---------------------------|---------------|----------------|--|--------------------------|---------|--|--|--|---|--|--|
| Agency | TMS Engineers, Inc. | | | | Duration, h | 0.25 | | | | | | |
| Analyst | ABC | Analysis Date | Jul 16, 2013 | | Area Type | Other | | | | | | |
| Jurisdiction | Orange Village | Time Period | AM Peak Period | | PHF | 0.92 | | | | | | |
| Intersection | @ Miles Road | Analysis Year | 2015 | | Analysis Period | 1> 7:00 | | | | | | |
| File Name | AM 15NB BrainardMiles.xus | | | | | | | | | | | |
| Project Description | No Build Conditions | | | | | | | | | | | |

| Demand Information | EB | | | WB | | | NB | | | SB | | |
|--------------------|----|-----|----|----|-----|-----|----|----|----|----|----|----|
| Approach Movement | L | T | R | L | T | R | L | T | R | L | T | R |
| Demand (v), veh/h | 26 | 190 | 33 | 19 | 338 | 166 | 48 | 92 | 22 | 54 | 47 | 37 |

| Signal Information | | | |  | | | | | | | | | | | | | | | | | | | | |
|--------------------|-------|-----------------|-----|--|-----|------|-----|------|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cycle, s | 90.0 | Reference Phase | 2 | | | | | | | | | | | | | | | | | | | | | |
| Offset, s | 0 | Reference Point | End | | | | | | | | | | | | | | | | | | | | | |
| Uncoordinated | No | Simult. Gap E/W | On | | | | | | | | | | | | | | | | | | | | | |
| Force Mode | Fixed | Simult. Gap N/S | On | Green | 5.0 | 38.5 | 5.0 | 21.5 | 0.0 | 0.0 | Yellow | 3.6 | 3.6 | 3.6 | 3.6 | 0.0 | 0.0 | Red | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 |

| Timer Results | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|------|------|------|------|------|------|------|------|
| Assigned Phase | 5 | 2 | 1 | 6 | 3 | 8 | 7 | 4 |
| Case Number | 1.1 | 4.0 | 1.1 | 4.0 | 1.1 | 4.0 | 1.1 | 4.0 |
| Phase Duration, s | 10.0 | 43.5 | 10.0 | 43.5 | 10.0 | 26.5 | 10.0 | 26.5 |
| Change Period, (Y+R _c), s | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Max Allow Headway (MAH), s | 3.1 | 0.0 | 3.1 | 0.0 | 3.1 | 3.1 | 3.1 | 3.1 |
| Queue Clearance Time (g _s), s | 2.8 | | 2.6 | | 3.9 | 7.1 | 4.2 | 5.8 |
| Green Extension Time (g _e), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 |
| Phase Call Probability | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| Max Out Probability | 1.00 | | 1.00 | | 1.00 | 0.00 | 1.00 | 0.00 |

| Movement Group Results | EB | | | WB | | | NB | | | SB | | |
|---|-------|-------|----|-------|-------|----|-------|-------|----|-------|-------|----|
| Approach Movement | L | T | R | L | T | R | L | T | R | L | T | R |
| Assigned Movement | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Adjusted Flow Rate (v), veh/h | 28 | 242 | | 21 | 548 | | 52 | 124 | | 59 | 91 | |
| Adjusted Saturation Flow Rate (s), veh/h/ln | 1723 | 1763 | | 1740 | 1725 | | 1757 | 1783 | | 1774 | 1726 | |
| Queue Service Time (g _s), s | 0.8 | 8.2 | | 0.6 | 24.0 | | 1.9 | 5.1 | | 2.2 | 3.8 | |
| Cycle Queue Clearance Time (g _c), s | 0.8 | 8.2 | | 0.6 | 24.0 | | 1.9 | 5.1 | | 2.2 | 3.8 | |
| Green Ratio (g/C) | 0.48 | 0.43 | | 0.48 | 0.43 | | 0.29 | 0.24 | | 0.29 | 0.24 | |
| Capacity (c), veh/h | 291 | 754 | | 526 | 738 | | 402 | 426 | | 380 | 412 | |
| Volume-to-Capacity Ratio (X) | 0.097 | 0.321 | | 0.039 | 0.743 | | 0.130 | 0.291 | | 0.154 | 0.221 | |
| Available Capacity (c _a), veh/h | 291 | 754 | | 526 | 738 | | 402 | 426 | | 380 | 412 | |
| Back of Queue (Q), veh/ln (50th percentile) | 0.3 | 3.4 | | 0.2 | 10.3 | | 0.8 | 2.1 | | 0.9 | 1.5 | |
| Queue Storage Ratio (RQ) (50th percentile) | 0.00 | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | |
| Uniform Delay (d ₁), s/veh | 16.1 | 17.1 | | 12.7 | 21.6 | | 23.3 | 28.0 | | 23.5 | 27.5 | |
| Incremental Delay (d ₂), s/veh | 0.1 | 1.1 | | 0.0 | 6.7 | | 0.1 | 0.1 | | 0.1 | 0.1 | |
| Initial Queue Delay (d ₃), s/veh | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Control Delay (d), s/veh | 16.1 | 18.2 | | 12.8 | 28.2 | | 23.3 | 28.2 | | 23.5 | 27.6 | |
| Level of Service (LOS) | B | B | | B | C | | C | C | | C | C | |
| Approach Delay, s/veh / LOS | 18.0 | | B | 27.7 | | C | 26.7 | | C | 26.0 | | C |
| Intersection Delay, s/veh / LOS | 25.1 | | | | | | C | | | | | |

| Multimodal Results | EB | | | WB | | | NB | | | SB | | |
|----------------------------|-----|--|---|-----|--|---|-----|--|---|-----|--|---|
| Pedestrian LOS Score / LOS | 2.3 | | B | 2.3 | | B | 2.3 | | B | 2.3 | | B |
| Bicycle LOS Score / LOS | 0.9 | | A | 1.4 | | A | 0.8 | | A | 0.7 | | A |

ALL-WAY STOP CONTROL ANALYSIS

| General Information | | Site Information | |
|----------------------|---------------------|------------------|------------------|
| Analyst | ABC | Intersection | Harvard & Lander |
| Agency/Co. | TMS Engineers, Inc. | Jurisdiction | Orange, OH |
| Date Performed | 7/19/2013 | Analysis Year | 2015 |
| Analysis Time Period | AM Peak Period | | |

Project ID *No Build Conditions*

East/West Street: *Harvard Road* North/South Street: *Lander Road*

Volume Adjustments and Site Characteristics

| Approach | Eastbound | | | Westbound | | |
|------------------|-----------|-----|----|-----------|----|-----|
| | L | T | R | L | T | R |
| Movement | | | | | | |
| Volume (veh/h) | 137 | 209 | 18 | 3 | 76 | 108 |
| %Thrus Left Lane | | | | | | |

| Approach | Northbound | | | Southbound | | |
|------------------|------------|-----|---|------------|----|-----|
| | L | T | R | L | T | R |
| Movement | | | | | | |
| Volume (veh/h) | 3 | 168 | 7 | 22 | 62 | 209 |
| %Thrus Left Lane | | | | | | |

| | Eastbound | | Westbound | | Northbound | | Southbound | |
|-------------------|------------|----|------------|----|------------|----|------------|----|
| | L1 | L2 | L1 | L2 | L1 | L2 | L1 | L2 |
| Configuration | <i>LTR</i> | | <i>LTR</i> | | <i>LTR</i> | | <i>LTR</i> | |
| PHF | 0.92 | | 0.92 | | 0.92 | | 0.92 | |
| Flow Rate (veh/h) | 394 | | 202 | | 192 | | 317 | |
| % Heavy Vehicles | 2 | | 1 | | 2 | | 2 | |
| No. Lanes | 1 | | 1 | | 1 | | 1 | |
| Geometry Group | 1 | | 1 | | 1 | | 1 | |
| Duration, T | 0.25 | | | | | | | |

Saturation Headway Adjustment Worksheet

| | | | | | | | | |
|---------------------|------|------|------|------|------|------|------|------|
| Prop. Left-Turns | 0.4 | | 0.0 | | 0.0 | | 0.1 | |
| Prop. Right-Turns | 0.0 | | 0.6 | | 0.0 | | 0.7 | |
| Prop. Heavy Vehicle | 0.0 | | 0.0 | | 0.0 | | 0.0 | |
| hLT-adj | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| hRT-adj | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| hHV-adj | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| hadj, computed | 0.1 | | -0.3 | | 0.0 | | -0.4 | |

Departure Headway and Service Time

| | | | | | | | | |
|----------------------------------|------|--|------|--|------|--|------|--|
| hd, initial value (s) | 3.20 | | 3.20 | | 3.20 | | 3.20 | |
| x, initial | 0.35 | | 0.18 | | 0.17 | | 0.28 | |
| hd, final value (s) | 5.99 | | 6.01 | | 6.45 | | 5.80 | |
| x, final value | 0.66 | | 0.34 | | 0.34 | | 0.51 | |
| Move-up time, m (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | |
| Service Time, t _s (s) | 4.0 | | 4.0 | | 4.4 | | 3.8 | |

Capacity and Level of Service

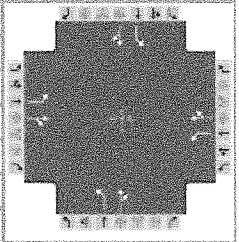
| | Eastbound | | Westbound | | Northbound | | Southbound | |
|----------------------------|-----------|----|-----------|----|------------|----|------------|----|
| | L1 | L2 | L1 | L2 | L1 | L2 | L1 | L2 |
| Capacity (veh/h) | 572 | | 452 | | 442 | | 567 | |
| Delay (s/veh) | 19.62 | | 12.03 | | 12.79 | | 14.69 | |
| LOS | C | | B | | B | | B | |
| Approach: Delay (s/veh) | 19.62 | | 12.03 | | 12.79 | | 14.69 | |
| LOS | C | | B | | B | | B | |
| Intersection Delay (s/veh) | 15.63 | | | | | | | |
| Intersection LOS | C | | | | | | | |

TWO-WAY STOP CONTROL SUMMARY

| General Information | | | Site Information | | | | | |
|--|---------------------|-----------|--|----------------|----------|------------|----|----------|
| Analyst | ABC | | Intersection | Miles & Lander | | | | |
| Agency/Co. | TMS Engineers, Inc. | | Jurisdiction | Orange, OH | | | | |
| Date Performed | 7/19/2013 | | Analysis Year | 2015 | | | | |
| Analysis Time Period | AM Peak Period | | | | | | | |
| Project Description <i>No Build Conditions</i> | | | | | | | | |
| East/West Street: <i>Miles Road</i> | | | North/South Street: <i>Lander Road</i> | | | | | |
| Intersection Orientation: <i>East-West</i> | | | Study Period (hrs): <i>0.25</i> | | | | | |
| Vehicle Volumes and Adjustments | | | | | | | | |
| Major Street | Eastbound | | | Westbound | | | | |
| Movement | 1 | 2 | 3 | 4 | 5 | 6 | | |
| | L | T | R | L | T | R | | |
| Volume (veh/h) | 89 | 190 | | | 359 | 138 | | |
| Peak-Hour Factor, PHF | 0.92 | 0.92 | 1.00 | 1.00 | 0.92 | 0.92 | | |
| Hourly Flow Rate, HFR (veh/h) | 96 | 206 | 0 | 0 | 390 | 149 | | |
| Percent Heavy Vehicles | 4 | -- | -- | 0 | -- | -- | | |
| Median Type | <i>Undivided</i> | | | | | | | |
| RT Channelized | | | 0 | | | 0 | | |
| Lanes | 0 | 1 | 0 | 0 | 1 | 0 | | |
| Configuration | <i>LT</i> | | | | | <i>TR</i> | | |
| Upstream Signal | | 0 | | | 0 | | | |
| Minor Street | Northbound | | | Southbound | | | | |
| Movement | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | L | T | R | L | T | R | | |
| Volume (veh/h) | | | | 34 | | 84 | | |
| Peak-Hour Factor, PHF | 1.00 | 1.00 | 1.00 | 0.92 | 1.00 | 0.92 | | |
| Hourly Flow Rate, HFR (veh/h) | 0 | 0 | 0 | 36 | 0 | 91 | | |
| Percent Heavy Vehicles | 0 | 0 | 0 | 3 | 0 | 3 | | |
| Percent Grade (%) | 0 | | | 0 | | | | |
| Flared Approach | | <i>N</i> | | | <i>N</i> | | | |
| Storage | | 0 | | | 0 | | | |
| RT Channelized | | | 0 | | | 0 | | |
| Lanes | 0 | 0 | 0 | 1 | 0 | 1 | | |
| Configuration | | | | <i>L</i> | | <i>R</i> | | |
| Delay, Queue Length, and Level of Service | | | | | | | | |
| Approach | Eastbound | Westbound | Northbound | | | Southbound | | |
| Movement | 1 | 4 | 7 | 8 | 9 | 10 | 11 | 12 |
| Lane Configuration | <i>LT</i> | | | | | <i>L</i> | | <i>R</i> |
| v (veh/h) | 96 | | | | | 36 | | 91 |
| C (m) (veh/h) | 1019 | | | | | 293 | | 596 |
| v/c | 0.09 | | | | | 0.12 | | 0.15 |
| 95% queue length | 0.31 | | | | | 0.41 | | 0.54 |
| Control Delay (s/veh) | 8.9 | | | | | 19.0 | | 12.1 |
| LOS | <i>A</i> | | | | | <i>C</i> | | <i>B</i> |
| Approach Delay (s/veh) | -- | -- | | | | 14.1 | | |
| Approach LOS | -- | -- | | | | <i>B</i> | | |

HCS 2010 Signalized Intersection Results Summary

| General Information | | | | Intersection Information | | | |
|---------------------|---------------------------|---------------|----------------|--------------------------|---------|--|--|
| Agency | TMS Engineers, Inc. | | | Duration, h | 0.25 | | |
| Analyst | ABC | Analysis Date | Jul 16, 2013 | Area Type | Other | | |
| Jurisdiction | Orange Village | Time Period | PM Peak Period | PHF | 0.92 | | |
| Intersection | @ Miles Road | Analysis Year | 2015 | Analysis Period | 1> 7:00 | | |
| File Name | PM 15NB BrainardMiles.xus | | | | | | |
| Project Description | No Build Conditions | | | | | | |



| Demand Information | EB | | | WB | | | NB | | | SB | | |
|--------------------|----|-----|----|----|-----|-----|----|----|----|-----|-----|----|
| Approach Movement | L | T | R | L | T | R | L | T | R | L | T | R |
| Demand (v), veh/h | 45 | 456 | 52 | 43 | 243 | 134 | 18 | 70 | 41 | 278 | 197 | 47 |

| Signal Information | | | | | | | | | | | | | | | | | | |
|--------------------|-------|-----------------|-----|--------|-----|------|-----|------|-----|-----|--|--|--|--|--|--|--|--|
| Cycle, s | 90.0 | Reference Phase | 2 | | | | | | | | | | | | | | | |
| Offset, s | 0 | Reference Point | End | | | | | | | | | | | | | | | |
| Uncoordinated | No | Simult. Gap E/W | On | | | | | | | | | | | | | | | |
| Force Mode | Fixed | Simult. Gap N/S | On | | | | | | | | | | | | | | | |
| | | | | Green | 5.0 | 35.8 | 7.4 | 21.8 | 0.0 | 0.0 | | | | | | | | |
| | | | | Yellow | 3.6 | 3.6 | 3.6 | 3.6 | 0.0 | 0.0 | | | | | | | | |
| | | | | Red | 1.4 | 1.4 | 1.4 | 1.4 | 0.0 | 0.0 | | | | | | | | |

| Timer Results | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|------|------|------|------|------|------|------|------|
| Assigned Phase | 5 | 2 | 1 | 6 | 3 | 8 | 7 | 4 |
| Case Number | 1.1 | 4.0 | 1.1 | 4.0 | 1.1 | 4.0 | 1.1 | 4.0 |
| Phase Duration, s | 10.0 | 40.8 | 10.0 | 40.8 | 12.4 | 26.8 | 12.4 | 26.8 |
| Change Period, (Y+R _c), s | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Max Allow Headway (MAH), s | 3.1 | 0.0 | 3.1 | 0.0 | 3.1 | 3.1 | 3.1 | 3.1 |
| Queue Clearance Time (g _s), s | 3.4 | | 3.4 | | 2.7 | 7.1 | 9.4 | 13.8 |
| Green Extension Time (g _e), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.5 |
| Phase Call Probability | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 |
| Max Out Probability | 1.00 | | 1.00 | | 0.03 | 0.00 | 1.00 | 0.03 |

| Movement Group Results | EB | | | WB | | | NB | | | SB | | |
|---|-------|-------|----|-------|-------|----|-------|-------|----|-------|-------|----|
| Approach Movement | L | T | R | L | T | R | L | T | R | L | T | R |
| Assigned Movement | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Adjusted Flow Rate (v), veh/h | 49 | 552 | | 47 | 410 | | 20 | 121 | | 302 | 265 | |
| Adjusted Saturation Flow Rate (s), veh/h/ln | 1723 | 1777 | | 1740 | 1717 | | 1757 | 1730 | | 1774 | 1800 | |
| Queue Service Time (g _s), s | 1.4 | 24.4 | | 1.4 | 17.0 | | 0.7 | 5.1 | | 7.4 | 11.8 | |
| Cycle Queue Clearance Time (g _c), s | 1.4 | 24.4 | | 1.4 | 17.0 | | 0.7 | 5.1 | | 7.4 | 11.8 | |
| Green Ratio (g/C) | 0.45 | 0.40 | | 0.45 | 0.40 | | 0.32 | 0.24 | | 0.32 | 0.24 | |
| Capacity (c), veh/h | 352 | 707 | | 264 | 683 | | 347 | 419 | | 432 | 436 | |
| Volume-to-Capacity Ratio (X) | 0.139 | 0.781 | | 0.177 | 0.600 | | 0.056 | 0.288 | | 0.699 | 0.608 | |
| Available Capacity (c _a), veh/h | 352 | 707 | | 264 | 683 | | 347 | 419 | | 432 | 436 | |
| Back of Queue (Q), veh/ln (50th percentile) | 0.5 | 11.2 | | 0.5 | 7.2 | | 0.3 | 2.1 | | 2.8 | 5.1 | |
| Queue Storage Ratio (RQ) (50th percentile) | 0.00 | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | |
| Uniform Delay (d ₁), s/veh | 16.0 | 23.7 | | 17.9 | 21.4 | | 21.6 | 27.8 | | 28.1 | 30.3 | |
| Incremental Delay (d ₂), s/veh | 0.1 | 8.4 | | 0.1 | 3.9 | | 0.0 | 0.1 | | 4.2 | 1.8 | |
| Initial Queue Delay (d ₃), s/veh | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Control Delay (d), s/veh | 16.0 | 32.1 | | 18.1 | 25.3 | | 21.6 | 27.9 | | 32.2 | 32.1 | |
| Level of Service (LOS) | B | C | | B | C | | C | C | | C | C | |
| Approach Delay, s/veh / LOS | 30.8 | | C | 24.6 | | C | 27.0 | | C | 32.2 | | C |
| Intersection Delay, s/veh / LOS | 29.3 | | | | | | C | | | | | |

| Multimodal Results | EB | | WB | | NB | | SB | |
|----------------------------|-----|---|-----|---|-----|---|-----|---|
| Pedestrian LOS Score / LOS | 2.3 | B | 2.3 | B | 2.3 | B | 2.3 | B |
| Bicycle LOS Score / LOS | 1.5 | A | 1.2 | A | 0.7 | A | 1.4 | A |

ALL-WAY STOP CONTROL ANALYSIS

| General Information | | Site Information | |
|----------------------|---------------------|------------------|------------------|
| Analyst | ABC | Intersection | Harvard & Lander |
| Agency/Co. | TMS Engineers, Inc. | Jurisdiction | Orange, OH |
| Date Performed | 7/19/2013 | Analysis Year | 2015 |
| Analysis Time Period | PM Peak Period | | |

Project ID *No Build Conditions*

East/West Street: *Harvard Road* North/South Street: *Lander Road*

Volume Adjustments and Site Characteristics

| Approach | Eastbound | | | Westbound | | |
|------------------|-----------|-----|---|-----------|-----|-----|
| | L | T | R | L | T | R |
| Movement | | | | | | |
| Volume (veh/h) | 34 | 158 | 5 | 11 | 246 | 151 |
| %Thrus Left Lane | | | | | | |

| Approach | Northbound | | | Southbound | | |
|------------------|------------|----|---|------------|-----|----|
| | L | T | R | L | T | R |
| Movement | | | | | | |
| Volume (veh/h) | 3 | 73 | 6 | 261 | 115 | 99 |
| %Thrus Left Lane | | | | | | |

| | Eastbound | | Westbound | | Northbound | | Southbound | |
|-------------------|------------|----|------------|----|------------|----|------------|----|
| | L1 | L2 | L1 | L2 | L1 | L2 | L1 | L2 |
| Configuration | <i>LTR</i> | | <i>LTR</i> | | <i>LTR</i> | | <i>LTR</i> | |
| PHF | 0.92 | | 0.92 | | 0.92 | | 0.92 | |
| Flow Rate (veh/h) | 212 | | 442 | | 88 | | 514 | |
| % Heavy Vehicles | 2 | | 1 | | 2 | | 2 | |
| No. Lanes | 1 | | 1 | | 1 | | 1 | |
| Geometry Group | 1 | | 1 | | 1 | | 1 | |
| Duration, T | 0.25 | | | | | | | |

Saturation Headway Adjustment Worksheet

| | | | | | | | | |
|---------------------|------|------|------|------|------|------|------|------|
| Prop. Left-Turns | 0.2 | | 0.0 | | 0.0 | | 0.6 | |
| Prop. Right-Turns | 0.0 | | 0.4 | | 0.1 | | 0.2 | |
| Prop. Heavy Vehicle | 0.0 | | 0.0 | | 0.0 | | 0.0 | |
| hLT-adj | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| hRT-adj | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 | -0.6 |
| hHV-adj | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 |
| hadj, computed | 0.1 | | -0.2 | | -0.0 | | 0.0 | |

Departure Headway and Service Time

| | | | | | | | | |
|----------------------------------|------|--|------|--|------|--|------|--|
| hd, initial value (s) | 3.20 | | 3.20 | | 3.20 | | 3.20 | |
| x, initial | 0.19 | | 0.39 | | 0.08 | | 0.46 | |
| hd, final value (s) | 7.09 | | 6.31 | | 7.51 | | 6.32 | |
| x, final value | 0.42 | | 0.77 | | 0.18 | | 0.90 | |
| Move-up time, m (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | |
| Service Time, t _s (s) | 5.1 | | 4.3 | | 5.5 | | 4.3 | |

Capacity and Level of Service

| | Eastbound | | Westbound | | Northbound | | Southbound | |
|----------------------------|-----------|----|-----------|----|------------|----|------------|----|
| | L1 | L2 | L1 | L2 | L1 | L2 | L1 | L2 |
| Capacity (veh/h) | 462 | | 551 | | 338 | | 562 | |
| Delay (s/veh) | 15.09 | | 27.63 | | 12.19 | | 42.63 | |
| LOS | C | | D | | B | | E | |
| Approach: Delay (s/veh) | 15.09 | | 27.63 | | 12.19 | | 42.63 | |
| LOS | C | | D | | B | | E | |
| Intersection Delay (s/veh) | 30.57 | | | | | | | |
| Intersection LOS | D | | | | | | | |

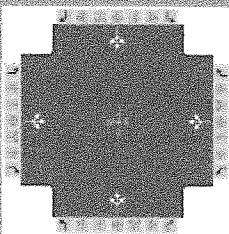
TWO-WAY STOP CONTROL SUMMARY

| General Information | | Site Information | | | | | | |
|---|---------------------|------------------|--|------------|----------|------------|----|----------|
| Analyst | ABC | Intersection | Miles & Lander | | | | | |
| Agency/Co. | TMS Engineers, Inc. | Jurisdiction | Orange, OH | | | | | |
| Date Performed | 7/19/2013 | Analysis Year | 2015 | | | | | |
| Analysis Time Period | PM Peak Period | | | | | | | |
| Project Description: <i>No Build Conditions</i> | | | | | | | | |
| East/West Street: <i>Miles Road</i> | | | North/South Street: <i>Lander Road</i> | | | | | |
| Intersection Orientation: <i>East-West</i> | | | Study Period (hrs): <i>0.25</i> | | | | | |
| Vehicle Volumes and Adjustments | | | | | | | | |
| Major Street | Eastbound | | | Westbound | | | | |
| Movement | 1 | 2 | 3 | 4 | 5 | 6 | | |
| | L | T | R | L | T | R | | |
| Volume (veh/h) | 103 | 445 | | | 214 | 51 | | |
| Peak-Hour Factor, PHF | 0.92 | 0.92 | 1.00 | 1.00 | 0.92 | 0.92 | | |
| Hourly Flow Rate, HFR (veh/h) | 111 | 483 | 0 | 0 | 232 | 55 | | |
| Percent Heavy Vehicles | 4 | -- | -- | 0 | -- | -- | | |
| Median Type | <i>Undivided</i> | | | | | | | |
| RT Channelized | | | 0 | | | 0 | | |
| Lanes | 0 | 1 | 0 | 0 | 1 | 0 | | |
| Configuration | <i>LT</i> | | | | | <i>TR</i> | | |
| Upstream Signal | | 0 | | | 0 | | | |
| Minor Street | Northbound | | | Southbound | | | | |
| Movement | 7 | 8 | 9 | 10 | 11 | 12 | | |
| | L | T | R | L | T | R | | |
| Volume (veh/h) | | | | 115 | | 174 | | |
| Peak-Hour Factor, PHF | 1.00 | 1.00 | 1.00 | 0.92 | 1.00 | 0.92 | | |
| Hourly Flow Rate, HFR (veh/h) | 0 | 0 | 0 | 124 | 0 | 189 | | |
| Percent Heavy Vehicles | 0 | 0 | 0 | 3 | 0 | 3 | | |
| Percent Grade (%) | 0 | | | 0 | | | | |
| Flared Approach | | <i>N</i> | | | <i>N</i> | | | |
| Storage | | 0 | | | 0 | | | |
| RT Channelized | | | 0 | | | 0 | | |
| Lanes | 0 | 0 | 0 | 1 | 0 | 1 | | |
| Configuration | | | | <i>L</i> | | <i>R</i> | | |
| Delay, Queue Length, and Level of Service | | | | | | | | |
| Approach | Eastbound | Westbound | Northbound | | | Southbound | | |
| Movement | 1 | 4 | 7 | 8 | 9 | 10 | 11 | 12 |
| Lane Configuration | <i>LT</i> | | | | | <i>L</i> | | <i>R</i> |
| v (veh/h) | 111 | | | | | 124 | | 189 |
| C (m) (veh/h) | 1264 | | | | | 257 | | 776 |
| v/c | 0.09 | | | | | 0.48 | | 0.24 |
| 95% queue length | 0.29 | | | | | 2.44 | | 0.95 |
| Control Delay (s/veh) | 8.1 | | | | | 31.4 | | 11.1 |
| LOS | <i>A</i> | | | | | <i>D</i> | | <i>B</i> |
| Approach Delay (s/veh) | -- | -- | | | | 19.2 | | |
| Approach LOS | -- | -- | | | | <i>C</i> | | |

HCS 2010 Signalized Intersection Results Summary

General Information

| | | | | | |
|---------------------|-------------------------------|---------------|----------------|-----------------|---------|
| Agency | TMS Engineers, Inc. | | | Duration, h | 0.25 |
| Analyst | ABC | Analysis Date | Jul 22, 2013 | Area Type | Other |
| Jurisdiction | Orange, OH | Time Period | AM Peak Period | PHF | 0.92 |
| Intersection | @ Lander Road | Analysis Year | 2015 | Analysis Period | 1> 7:00 |
| File Name | AM 15NB HarvardLander-IMP.xus | | | | |
| Project Description | Proposed Signal Control | | | | |



Demand Information

| Approach Movement | EB | | | WB | | | NB | | | SB | | |
|-------------------|-----|-----|----|----|----|-----|----|-----|---|----|----|-----|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| Demand (v), veh/h | 137 | 209 | 18 | 3 | 76 | 108 | 3 | 168 | 7 | 22 | 62 | 209 |

Signal Information

| | | | | | | | | | | | | | |
|---------------|-------|-----------------|-----|--------|------|------|-----|-----|-----|-----|--|--|--|
| Cycle, s | 90.0 | Reference Phase | 2 | | | | | | | | | | |
| Offset, s | 0 | Reference Point | End | Green | 42.3 | 37.7 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| Uncoordinated | No | Simult. Gap E/W | On | Yellow | 3.6 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| Force Mode | Fixed | Simult. Gap N/S | On | Red | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | | | |

Timer Results

| | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|-----|------|-----|------|-----|------|-----|------|
| Assigned Phase | | 2 | | 6 | | 8 | | 4 |
| Case Number | | 8.0 | | 8.0 | | 8.0 | | 8.0 |
| Phase Duration, s | | 47.3 | | 47.3 | | 42.7 | | 42.7 |
| Change Period, (Y+R _c), s | | 5.0 | | 5.0 | | 5.0 | | 5.0 |
| Max Allow Headway (MAH), s | | 0.0 | | 0.0 | | 3.2 | | 3.2 |
| Queue Clearance Time (g _s), s | | | | | | 8.1 | | 14.5 |
| Green Extension Time (g _e), s | | 0.0 | | 0.0 | | 1.0 | | 1.0 |
| Phase Call Probability | | | | | | 1.00 | | 1.00 |
| Max Out Probability | | | | | | 0.00 | | 0.00 |

Movement Group Results

| Approach Movement | EB | | | WB | | | NB | | | SB | | |
|---|-------|---|----|-------|---|----|-------|---|----|-------|---|----|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| Assigned Movement | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Adjusted Flow Rate (v), veh/h | 396 | | | 203 | | | 193 | | | 318 | | |
| Adjusted Saturation Flow Rate (s), veh/h/ln | 1544 | | | 1701 | | | 1845 | | | 1620 | | |
| Queue Service Time (g _s), s | 9.3 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| Cycle Queue Clearance Time (g _c), s | 15.8 | | | 6.5 | | | 6.1 | | | 12.5 | | |
| Green Ratio (g/C) | 0.47 | | | 0.47 | | | 0.42 | | | 0.42 | | |
| Capacity (c), veh/h | 781 | | | 840 | | | 813 | | | 722 | | |
| Volume-to-Capacity Ratio (X) | 0.507 | | | 0.242 | | | 0.238 | | | 0.441 | | |
| Available Capacity (c _a), veh/h | 781 | | | 840 | | | 813 | | | 722 | | |
| Back of Queue (Q), veh/ln (50th percentile) | 5.8 | | | 2.5 | | | 2.5 | | | 4.5 | | |
| Queue Storage Ratio (RQ) (50th percentile) | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Uniform Delay (d ₁), s/veh | 16.6 | | | 14.4 | | | 17.0 | | | 18.8 | | |
| Incremental Delay (d ₂), s/veh | 2.3 | | | 0.7 | | | 0.1 | | | 0.2 | | |
| Initial Queue Delay (d ₃), s/veh | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| Control Delay (d), s/veh | 19.0 | | | 15.0 | | | 17.0 | | | 19.0 | | |
| Level of Service (LOS) | B | | | B | | | B | | | B | | |
| Approach Delay, s/veh / LOS | 19.0 | B | | 15.0 | B | | 17.0 | B | | 19.0 | B | |
| Intersection Delay, s/veh / LOS | 17.9 | | | | | | B | | | | | |

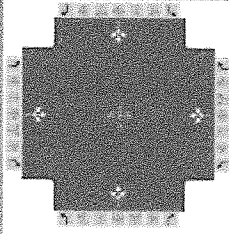
Multimodal Results

| | EB | | | WB | | | NB | | | SB | | |
|----------------------------|-----|---|--|-----|---|--|-----|---|--|-----|---|--|
| Pedestrian LOS Score / LOS | 2.1 | B | | 2.1 | B | | 2.1 | B | | 2.1 | B | |
| Bicycle LOS Score / LOS | 1.1 | A | | 0.8 | A | | 0.8 | A | | 1.0 | A | |

HCS 2010 Signalized Intersection Results Summary

General Information

| | | | | | |
|---------------------|-------------------------------|---------------|----------------|--------------------------|-------|
| Agency | TMS Engineers, Inc. | | | Intersection Information | |
| Analyst | ABC | Analysis Date | Jul 22, 2013 | Duration, h | 0.25 |
| Jurisdiction | Orange, OH | Time Period | PM Peak Period | Area Type | Other |
| Intersection | @ Lander Road | Analysis Year | 2015 | PHF | 0.92 |
| File Name | PM 15NB HarvardLander-IMP.xus | | | | |
| Project Description | Proposed Signal Control | | | | |



Demand Information

| Approach Movement | EB | | | WB | | | NB | | | SB | | |
|-------------------|----|-----|---|----|-----|-----|----|----|---|-----|-----|----|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| Demand (v), veh/h | 34 | 158 | 5 | 11 | 246 | 151 | 3 | 73 | 6 | 261 | 115 | 99 |

Signal Information

| | | | | | | | | | | | | | |
|---------------|-------|-----------------|-----|--------|------|------|-----|-----|-----|-----|--|--|--|
| Cycle, s | 90.0 | Reference Phase | 2 | | | | | | | | | | |
| Offset, s | 0 | Reference Point | End | | | | | | | | | | |
| Uncoordinated | No | Simult. Gap E/W | On | Green | 38.7 | 41.3 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| Force Mode | Fixed | Simult. Gap N/S | On | Yellow | 3.6 | 3.6 | 0.0 | 0.0 | 0.0 | 0.0 | | | |
| | | | | Red | 1.4 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | | | |

Timer Results

| | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|-----|------|-----|------|-----|------|-----|------|
| Assigned Phase | | 2 | | 6 | | 8 | | 4 |
| Case Number | | 8.0 | | 8.0 | | 8.0 | | 8.0 |
| Phase Duration, s | | 43.7 | | 43.7 | | 46.3 | | 46.3 |
| Change Period, (Y+R _c), s | | 5.0 | | 5.0 | | 5.0 | | 5.0 |
| Max Allow Headway (MAH), s | | 0.0 | | 0.0 | | 3.2 | | 3.2 |
| Queue Clearance Time (g _s), s | | | | | | 4.5 | | 27.8 |
| Green Extension Time (g _e), s | | 0.0 | | 0.0 | | 1.3 | | 1.2 |
| Phase Call Probability | | | | | | 1.00 | | 1.00 |
| Max Out Probability | | | | | | 0.00 | | 0.01 |

Movement Group Results

| Approach Movement | EB | | | WB | | | NB | | | SB | | |
|---|-------|---|----|-------|---|----|-------|---|----|-------|---|----|
| | L | T | R | L | T | R | L | T | R | L | T | R |
| Assigned Movement | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| Adjusted Flow Rate (v), veh/h | 214 | | | 443 | | | 89 | | | 516 | | |
| Adjusted Saturation Flow Rate (s), veh/h/in | 1588 | | | 1754 | | | 1826 | | | 1480 | | |
| Queue Service Time (g _s), s | 0.0 | | | 0.0 | | | 0.0 | | | 23.4 | | |
| Cycle Queue Clearance Time (g _c), s | 6.7 | | | 17.2 | | | 2.5 | | | 25.8 | | |
| Green Ratio (g/C) | 0.43 | | | 0.43 | | | 0.46 | | | 0.46 | | |
| Capacity (c), veh/h | 730 | | | 795 | | | 879 | | | 741 | | |
| Volume-to-Capacity Ratio (X) | 0.294 | | | 0.557 | | | 0.101 | | | 0.697 | | |
| Available Capacity (c _a), veh/h | 730 | | | 795 | | | 879 | | | 741 | | |
| Back of Queue (Q), veh/in (50th percentile) | 2.9 | | | 7.2 | | | 1.0 | | | 8.7 | | |
| Queue Storage Ratio (RQ) (50th percentile) | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Uniform Delay (d ₁), s/veh | 16.5 | | | 19.5 | | | 13.8 | | | 20.0 | | |
| Incremental Delay (d ₂), s/veh | 1.0 | | | 2.8 | | | 0.0 | | | 2.4 | | |
| Initial Queue Delay (d ₃), s/veh | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| Control Delay (d), s/veh | 17.6 | | | 22.3 | | | 13.9 | | | 22.4 | | |
| Level of Service (LOS) | B | | | C | | | B | | | C | | |
| Approach Delay, s/veh / LOS | 17.6 | B | | 22.3 | C | | 13.9 | B | | 22.4 | C | |
| Intersection Delay, s/veh / LOS | 21.0 | | | | | | C | | | | | |

Multimodal Results

| | EB | | | WB | | | NB | | | SB | | |
|----------------------------|-----|---|--|-----|---|--|-----|---|--|-----|---|--|
| Pedestrian LOS Score / LOS | 2.1 | B | | 2.1 | B | | 2.1 | B | | 2.1 | B | |
| Bicycle LOS Score / LOS | 0.8 | A | | 1.2 | A | | 0.6 | A | | 1.3 | A | |