**Figure 13.** Annual Safety Impact of Proposed Alternatives and Countermeasures

All potential scenarios represent an improvement over the existing condition. However, the implementation of a single-lane roundabout offers noticeably improved safety performance over the other alternatives. Additional operational analysis is required to determine the operational performance of these alternatives when compared to one another.

Operational Impact of Potential Alternatives and Countermeasures

Table 11 provides a summary of the operational impacts among the potential alternatives. Of these alternatives, the multilane roundabout was evaluated to produce the highest amount of operational improvement at the study intersection.

Table 11. Year 2041 Operational analysis Results

| Analysis Year | Conflict Points | Peak Period | Delay (LOS) | | | | | Max V/C Ratio |
|------------------------|-----------------|-------------|-------------|----------|----------|-----------|-----------|---------------|
| | | | EB | WB | NB | SB | Overall | |
| Exclusive Turn Lanes | 32 | AM | 2.9 (A) | 0.0 (A) | >300 (F) | >300 (F) | >300 (F) | >5 |
| | | PM | 1.1 (A) | 0.0 (A) | >300 (F) | >300 (F) | >300 (F) | >5 |
| Single Lane Roundabout | 8 | AM | 31 (D) | 277 (F) | 10 (B) | 216 (F) | 190.4 (F) | 1.58 |
| | | PM | 338 (F) | 32 (D) | 25 (C) | 35 (D) | 185.9 (F) | 1.71 |
| Multi Lane Roundabout | 16 | AM | 8.9 (A) | 21.6 (C) | 9.1 (A) | 185.4 (F) | 41.4 (E) | 1.31 |
| | | PM | 32.4 (D) | 8.8 (A) | 19.9 (C) | 32.7 (D) | 24.7 (C) | 0.91 |
| Traffic Signal | 32 | AM | 116.7 (F) | 39.5 (D) | 34.1 (C) | 50.8 (D) | 63.3 (E) | 2.22 |
| | | PM | 237.3 (F) | 15.1 (B) | 46.9 (D) | 112.4 (F) | 148.6 (F) | 3.75 |

CONCLUSION

The previous sections of this report demonstrate that the proposed alternatives and countermeasures will improve operations compared to the no-build condition, and have been proven in prior research to improve traffic safety. Therefore, GDOT should consider the recommended safety countermeasures and treatments presented in **Table 12** for implementation.

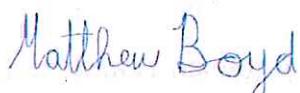
Table 12. Suggested Safety Countermeasures for SR 124 at SR 60 Study Intersection

| No. | Countermeasure | Approximate Implementation Timeline | Safety Issue Addressed |
|-----|---|-------------------------------------|------------------------|
| 1 | Convert the existing intersection to a modern multilane roundabout. | Long | 1, 2, 3 |

RECOMMENDATIONS

Based on the information presented in this report, the Atkins team proposes converting the SR 124 and SR 60/Sam Freeman Road intersection to a modern multi-lane roundabout. Converting the intersection to a modern multi-lane roundabout will encourage speed reduction on SR 124 by introducing a left offset, while also minimizing the likelihood of severe angle crashes at the intersection. Installation of non-motorized facilities should also be considered to allow for pedestrian and bicyclist activity. Since the roundabout can immediately address all the safety issues of the intersection and provide operational benefits as well, the Atkins team recommends that the Department move forward with a project to convert the intersection into a modern multi-lane roundabout when resources become available.

PREPARED BY:



6/8/2018

DATE:

Matt Boyd, EIT
Atkins North America, Inc

RECOMMENDED BY:



6/8/2018

DATE:

Travis Brewer, PE
Atkins North America, Inc

RECOMMENDED BY:

6.11.18

DATE:

Sue Anne Decker, PE
District Traffic Engineer

APPENDICES

Appendix A: Safety Risk Matrix Background

Appendix B: Planning Level Capacity Analysis

Appendix C: Collision Diagram

Appendix D: Turning Movement Count Summary

Appendix E: Directional Tube Count Summary

Appendix F: Existing Conditions Analysis – Synchro Reports

Appendix G: Roundabout Analysis (Build & Design Years) – GDOT Tool (v4.1)

Appendix H: Roundabout Analysis (Build & Design Years) – SIDRA 7

Appendix I: Turn Lanes Alternative – Synchro Reports

Appendix J: Signal Alternative – Synchro Reports

Appendix K: Traffic Signal Warrant Analyses

Appendix L: Projected Turning Movement Diagrams

Appendix M: Intersection Control Evaluation (ICE)

Appendix A: Safety Risk Matrix Background

Crash Frequency

| Estimated | | Expected Crash Frequency (from HSM analysis) | Frequency Rating |
|-----------|-------------|--|------------------|
| Exposure | Probability | | |
| High | High | 10 or more crashes per year | Frequent |
| Medium | High | | |
| High | Medium | 1 to 9 crashes per year | Occasional |
| Medium | Medium | | |
| High | Low | Less than 1 crash per year, but more than 1 crash every five years | Infrequent |
| Low | Medium | | |
| Medium | Low | Less than 1 crash every five years | Rare |
| Low | Low | | |

Crash Severity

| Types of crashes | Expected crash severity | Severity rating |
|---|--|-----------------|
| Crashes involving high speeds or heavy vehicles, pedestrians, bicycles, or motorcycles | Probable fatality or incapacitating injury | Extreme |
| Crashes involving medium to high speeds; lane departure, angle, or left-turn crashes | Moderate to severe injury | High |
| Crashes involving low to medium speeds angle or left-turn crashes or high speeds and rear-end or side-swipe crashes | Minor to moderate injury | Moderate |
| Crashes involving low to medium speeds; rear-end or side-swipe crashes | Property damage only or minor injury | Low |

Safety Risk Matrix

| Frequency Rating | Severity Rating | | | |
|------------------|-----------------|----------|------|---------|
| | Low | Moderate | High | Extreme |
| Frequent | C | D | E | F |
| Occasional | B | C | D | E |
| Infrequent | A | B | C | D |
| Rare | A | A | B | C |

Appendix B: Planning Level Capacity Analysis

GDOT's design policy manual states that the ideal capacity of a two-lane roadway is 1,700 vehicles per hour (vph) in each direction and 2,000 vph per lane for a multilane highway. The manual also states that two-lane roadways are generally acceptable only if the design hour volume (DHV) is less than 800 vph in either direction. For the purposes of a "planning level capacity analysis," for two-lane roadways, the acceptable DHV of 800 needs to be converted to an acceptable daily volume and compared with GDOT's AADT counts to determine potential capacity issues. As the 800 vph is in either direction, it represents the directional design hour volume (DDHV). The calculation for DDHV using AADT is as follows:

$$\text{DDHV} = \text{AADT} * K * D \text{ where:}$$

K = proportion of the AADT that occurs during the design hour

D = proportion of the DHV that occurs in the heavier direction of travel

Since the DDHV is known (800 vph), assuming a K and D value allows for the calculation of a target daily volume or AADT in the above formula. Reasonable assumptions for K and D were made where K was assumed to be 0.10 (or 10 percent) and D was assumed to be 0.60 (or 60 percent). Using those in conjunction with GDOT's acceptable DDHV, the acceptable daily volume for a two-lane road is computed as follows:

$$\text{Two lane acceptable daily volume} = 800 / (0.10 * 0.60) = 13,333 \text{ (13,300 rounded).}$$

For multilane roadways, a ratio was computed of the acceptable DHV (800) for a two-lane roadway divided by the ideal capacity (1,700) of a two-lane roadway to allow for the computation of an acceptable DHV for a multilane roadway (ratio = $800 / 1700 = 0.47$). Using this ratio along with the ideal hourly capacity for a multilane roadway (2,000 vehicles per lane), the acceptable directional DHV for a multilane roadway is as follows:

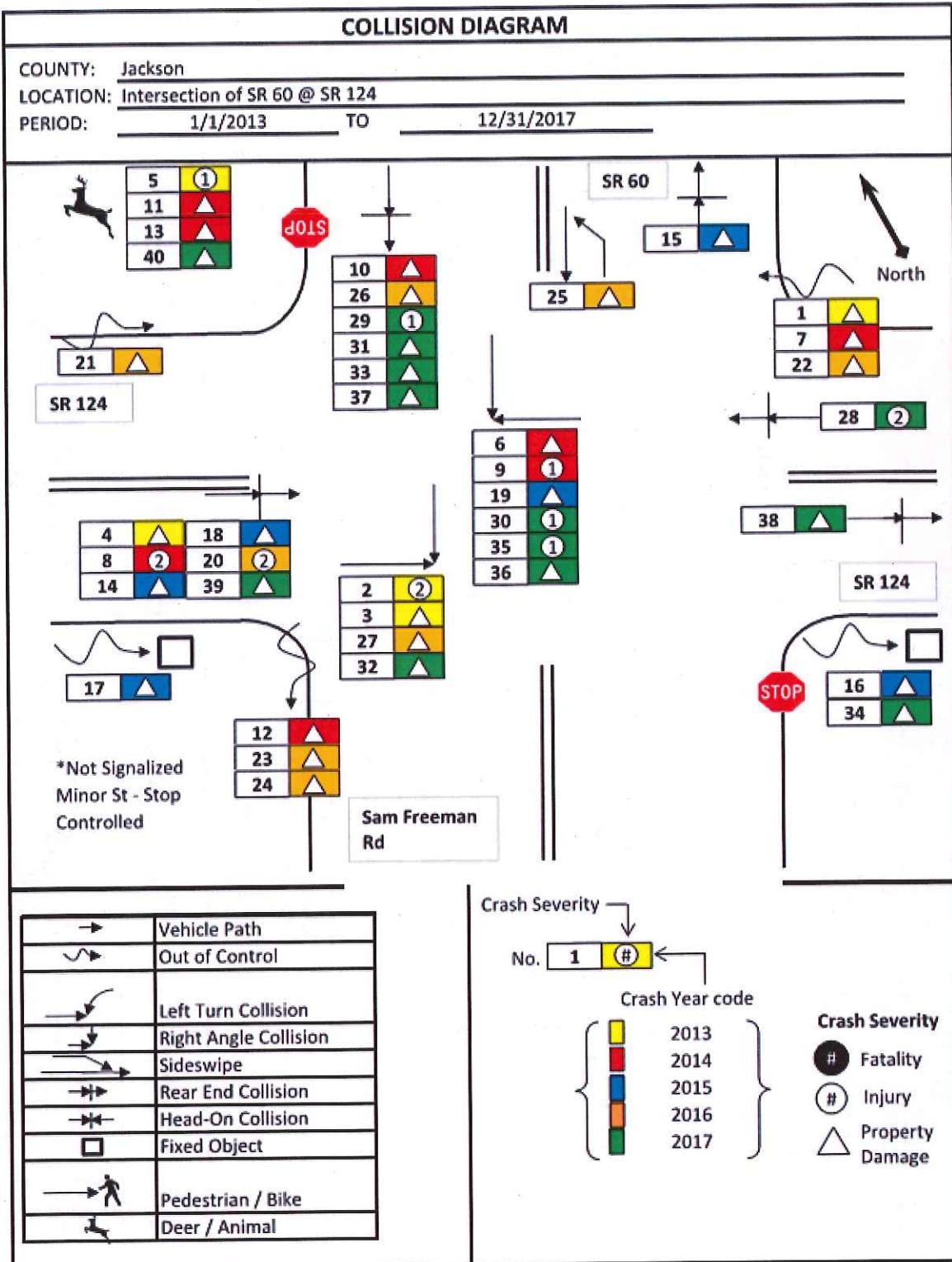
$$\text{Acceptable multilane DDHV} = 2,000 * 0.47 * \# \text{ lanes} / 2$$

$$\text{Four lane roadway DDHV} = 2,000 * 0.47 * 4 / 2 = 1,880 \text{ vph}$$

To compute the multilane acceptable daily volume, the same formula is applied to the DDHV from the two-lane:

$$\text{Four lane acceptable daily volume} = 1,880 / (0.10 * 0.60) = 31,333 \text{ (31,300 rounded)}$$

Appendix C: Collision Diagrams



| CRASH SUMMARY | | | | | | | | | | |
|--|------|------------|-----|-------------|------------|-------|------|-------------|---------|--------------|
| COUNTY: Jackson LOCATION: Intersection of SR 60 @ SR 124 PERIOD: 01/01/13 to 12/31/17 | | | | | | | | | | |
| No. | Year | Date | Day | Time | Type | Fatal | Inj. | Light Cond. | Surface | Accident No. |
| 1 | 2013 | 1/11/2013 | Fri | 9:46:00 PM | Single Veh | 0 | 0 | Night | Wet | 4358943 |
| 2 | 2013 | 6/29/2013 | Sat | 4:51:00 PM | Angle | 0 | 2 | Day | Dry | 4492872 |
| 3 | 2013 | 9/23/2013 | Mon | 4:50:00 PM | Angle | 0 | 0 | Day | Dry | 4581558 |
| 4 | 2013 | 9/26/2013 | Thu | 6:00:00 PM | Rear End | 0 | 0 | Day | Dry | 4587078 |
| 5 | 2013 | 11/28/2013 | Thu | 5:55:00 AM | Deer | 0 | 1 | Day | Dry | 4660253 |
| 6 | 2014 | 2/21/2014 | Fri | 5:26:00 PM | Angle | 0 | 0 | Day | Dry | 4740482 |
| 7 | 2014 | 5/25/2014 | Sun | 2:57:00 PM | Single Veh | 0 | 0 | Day | Dry | 4857978 |
| 8 | 2014 | 6/9/2014 | Mon | 6:29:00 PM | Rear End | 0 | 2 | Day | Dry | 4872645 |
| 9 | 2014 | 10/24/2014 | Fri | 11:05:00 PM | Angle | 0 | 1 | Night | Dry | 5029412 |
| 10 | 2014 | 11/23/2014 | Sun | 10:17:00 AM | Rear End | 0 | 0 | Day | Wet | 5062086 |
| 11 | 2014 | 12/4/2014 | Thu | 7:44:00 PM | Deer | 0 | 0 | Night | Wet | 5075726 |
| 12 | 2014 | 12/9/2014 | Tue | 1:38:00 PM | Single Veh | 0 | 0 | Day | Dry | 5087830 |
| 13 | 2014 | 12/20/2014 | Sat | 7:15:00 PM | Deer | 0 | 0 | Night | Dry | 5103780 |
| 14 | 2015 | 4/1/2015 | Wed | 9:13:00 PM | Sideswipe | 0 | 0 | Night | Dry | 5240383 |
| 15 | 2015 | 6/25/2015 | Thu | 3:54:00 PM | Rear End | 0 | 0 | Day | Dry | 5337179 |
| 16 | 2015 | 7/21/2015 | Tue | 3:30:00 PM | Single Veh | 0 | 0 | Day | Dry | 5364891 |
| 17 | 2015 | 9/4/2015 | Fri | 3:43:00 PM | Single Veh | 0 | 0 | Day | Dry | 5419003 |
| 18 | 2015 | 11/6/2015 | Fri | 2:48:00 PM | Rear End | 0 | 0 | Day | Wet | 5505042 |
| 19 | 2015 | 12/20/2015 | Sun | 11:10:00 AM | Angle | 0 | 0 | Day | Dry | 5560405 |
| 20 | 2016 | 2/18/2016 | Thu | 3:49:00 PM | Rear End | 0 | 2 | Day | Dry | 5642077 |
| 21 | 2016 | 3/19/2016 | Sat | 1:48:00 AM | Single Veh | 0 | 0 | Night | Dry | 5685716 |
| 22 | 2016 | 3/30/2016 | Wed | 5:11:00 PM | Single Veh | 0 | 0 | Day | Dry | 5696060 |
| 23 | 2016 | 4/24/2016 | Sun | 6:00:00 AM | Single Veh | 0 | 0 | Night | Dry | 5729280 |
| 24 | 2016 | 6/18/2016 | Sat | 6:16:00 AM | Single Veh | 0 | 0 | Dawn | Dry | 5801525 |
| 25 | 2016 | 9/3/2016 | Sat | 4:00:00 PM | Sideswipe | 0 | 0 | Day | Dry | 5906560 |
| 26 | 2016 | 10/13/2016 | Thu | 7:47:00 AM | Rear End | 0 | 0 | Day | Dry | 5959818 |
| 27 | 2016 | 12/7/2016 | Wed | 4:30:00 PM | Angle | 0 | 0 | Day | Dry | 6031737 |
| 28 | 2017 | 1/27/2017 | Fri | 10:31:00 AM | Rear End | 0 | 2 | Day | Dry | 6095711 |
| 29 | 2017 | 2/14/2017 | Tue | 4:45:00 PM | Rear End | 0 | 1 | Day | Dry | 6118548 |
| 30 | 2017 | 2/20/2017 | Mon | 6:08:00 PM | Angle | 0 | 1 | Day | Dry | 6126252 |
| 31 | 2017 | 4/20/2017 | Thu | 7:51:00 AM | Rear End | 0 | 0 | Day | Dry | 6201099 |
| 32 | 2017 | 5/8/2017 | Mon | 1:17:00 PM | Angle | 0 | 0 | Day | Dry | 6226311 |
| 33 | 2017 | 5/18/2017 | Thu | 5:47:00 PM | Rear End | 0 | 0 | Day | Dry | 6243353 |
| 34 | 2017 | 5/21/2017 | Sun | 10:56:00 PM | Single Veh | 0 | 0 | Night | Dry | 6243368 |
| 35 | 2017 | 6/5/2017 | Mon | 5:05:00 AM | Angle | 0 | 1 | Night | Wet | 6265784 |

| CRASH SUMMARY | | | | | | | | | | |
|---------------|------|------------|-----|-------------|----------|-------|------|-------------|---------|--------------|
| No. | Year | Date | Day | Time | Type | Fatal | Inj. | Light Cond. | Surface | Accident No. |
| 36 | | 6/10/2017 | Sat | 3:12:00 PM | Angle | 0 | 0 | Night | Dry | 6272156 |
| 37 | | 6/13/2017 | Tue | 5:45:00 PM | Rear End | 0 | 0 | Day | Dry | 6273177 |
| 38 | | 6/23/2017 | Fri | 10:03:00 PM | Rear End | 0 | 0 | Night | Wet | 6288291 |
| 39 | | 6/30/2017 | Fri | 5:35:00 PM | Rear End | 0 | 0 | Day | Dry | 6296252 |
| 40 | | 11/23/2017 | Thu | 3:56:00 PM | Deer | 0 | 0 | Day | Dry | 6487817 |
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 66 | | | | | | | | | | |
| 67 | | | | | | | | | | |
| 68 | | | | | | | | | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | | | | | |

Appendix E: Directional Tube Count Summary
Atkins
Twenty-Four Hour Traffic Count

Location: SR 124 at SR 60

| Hour Ending | SR 124 E of SR 60 | | SR 60 N of SR 124 | | Sam Freeman Road S of SR 124 | | SR 124 W of SR 60 | | Intersection Approach Volumes | | | | |
|-------------|-------------------|-------|-------------------|-------|------------------------------|-----|-------------------|-------|-------------------------------|-------|-----|-------|--------|
| | EB | WB | NB | SB | NB | SB | EB | WB | EB | SB | NB | WB | TOTAL |
| | 1:00 AM | 33 | 19 | 8 | 7 | 0 | 0 | 33 | 17 | 33 | 7 | 0 | 19 |
| 2:00 AM | 34 | 12 | 6 | 10 | 0 | 0 | 27 | 9 | 27 | 10 | 0 | 12 | 49 |
| 3:00 AM | 15 | 8 | 4 | 5 | 0 | 0 | 15 | 9 | 15 | 5 | 0 | 8 | 28 |
| 4:00 AM | 9 | 35 | 9 | 4 | 0 | 1 | 9 | 28 | 9 | 4 | 0 | 35 | 48 |
| 5:00 AM | 47 | 122 | 21 | 34 | 1 | 1 | 41 | 128 | 41 | 34 | 1 | 122 | 198 |
| 6:00 AM | 59 | 318 | 29 | 60 | 0 | 2 | 46 | 326 | 46 | 60 | 0 | 318 | 424 |
| 7:00 AM | 129 | 560 | 125 | 117 | 13 | 6 | 113 | 524 | 113 | 117 | 13 | 560 | 803 |
| 8:00 AM | 413 | 848 | 293 | 195 | 14 | 11 | 397 | 716 | 397 | 195 | 14 | 848 | 1,454 |
| 9:00 AM | 225 | 557 | 135 | 140 | 6 | 11 | 199 | 533 | 199 | 140 | 6 | 557 | 902 |
| 10:00 AM | 233 | 391 | 89 | 121 | 6 | 8 | 204 | 386 | 204 | 121 | 6 | 391 | 722 |
| 11:00 AM | 236 | 333 | 115 | 103 | 8 | 10 | 223 | 292 | 223 | 103 | 8 | 333 | 667 |
| 12:00 PM | 278 | 357 | 106 | 116 | 6 | 18 | 249 | 315 | 249 | 116 | 6 | 357 | 728 |
| 1:00 PM | 342 | 376 | 145 | 128 | 12 | 9 | 325 | 345 | 325 | 128 | 12 | 376 | 841 |
| 2:00 PM | 383 | 310 | 128 | 128 | 8 | 14 | 355 | 267 | 355 | 128 | 8 | 310 | 801 |
| 3:00 PM | 457 | 335 | 144 | 139 | 11 | 19 | 454 | 315 | 454 | 139 | 11 | 335 | 939 |
| 4:00 PM | 578 | 431 | 196 | 150 | 8 | 15 | 559 | 356 | 559 | 150 | 8 | 431 | 1,148 |
| 5:00 PM | 718 | 421 | 195 | 179 | 16 | 19 | 684 | 367 | 684 | 179 | 16 | 421 | 1,300 |
| 6:00 PM | 812 | 460 | 227 | 279 | 12 | 19 | 741 | 403 | 741 | 279 | 12 | 460 | 1,492 |
| 7:00 PM | 622 | 384 | 166 | 167 | 13 | 11 | 590 | 354 | 590 | 167 | 13 | 384 | 1,154 |
| 8:00 PM | 430 | 221 | 127 | 96 | 17 | 9 | 428 | 196 | 428 | 96 | 17 | 221 | 762 |
| 9:00 PM | 362 | 158 | 93 | 96 | 9 | 9 | 339 | 137 | 339 | 96 | 9 | 158 | 602 |
| 10:00 PM | 223 | 120 | 69 | 47 | 5 | 2 | 222 | 101 | 222 | 47 | 5 | 120 | 394 |
| 11:00 PM | 118 | 54 | 32 | 34 | 2 | 5 | 110 | 47 | 110 | 34 | 2 | 54 | 200 |
| 12:00 AM | 58 | 25 | 9 | 14 | 2 | 2 | 57 | 28 | 57 | 14 | 2 | 25 | 98 |
| Total | 6,814 | 6,855 | 2,471 | 2,369 | 169 | 201 | 6,420 | 6,199 | 6,420 | 2,369 | 169 | 6,855 | 15,813 |

Intersection Volume: 15,813 Vehicles Per Day

A.M. Peak Hour Is From 7:00 AM TO 8:00 AM
Volume of 1,454 Is 9.2% Of 24-Hour VolumeP.M. Peak Hour Is From 5:00 PM TO 6:00 PM
Volume of 1,492 Is 9.4% Of 24-Hour Volume

Machine County Made By: All Traffic Data Services, Inc

Day-of-Week Count: Wednesday

Date of Count: 18-Apr-17

Report Prepared By: MB

Date Report Prepared: 1-May-18

Appendix F: Existing Conditions Analysis – Synchro Reports

2017 No Build AM Peak

HCM 2010 TWSC

3: Sam Freeman Rd/SR 60 & SR 124

4/23/2018

| Intersection | | | | | | | | | | | | | |
|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|--------|-------|-------|-------|--|
| Int Delay, s/veh | 12 | | | | | | | | | | | | |
| Movement | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR | |
| Traffic Vol, veh/h | 70 | 331 | 3 | 1 | 636 | 208 | 0 | 9 | 1 | 97 | 3 | 104 | |
| Future Vol, veh/h | 70 | 331 | 3 | 1 | 636 | 208 | 0 | 9 | 1 | 97 | 3 | 104 | |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop | |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield | |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | 125 | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Mvmt Flow | 76 | 360 | 3 | 1 | 691 | 226 | 0 | 10 | 1 | 105 | 3 | 113 | |
| Major/Minor | | | | | | | | | | | | | |
| Major1 | | | Major2 | | | Minor1 | | | Minor2 | | | | |
| Conflicting Flow All | 917 | 0 | 0 | 363 | 0 | 0 | 1322 | 1434 | 361 | 1326 | 1322 | 804 | |
| Stage 1 | - | - | - | - | - | - | 514 | 514 | - | 807 | 807 | - | |
| Stage 2 | - | - | - | - | - | - | 808 | 920 | - | 519 | 515 | - | |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | |
| Pot Cap-1 Maneuver | 744 | - | - | 1196 | - | - | 133 | 134 | 684 | 133 | 136 | 383 | |
| Stage 1 | - | - | - | - | - | - | 543 | 535 | - | 375 | 394 | - | |
| Stage 2 | - | - | - | - | - | - | 375 | 350 | - | 540 | 535 | - | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - | |
| Mov Cap-1 Maneuver | 744 | - | - | 1196 | - | - | 83 | 117 | 684 | 112 | 136 | 383 | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 83 | 117 | - | 112 | 136 | - | |
| Stage 1 | - | - | - | - | - | - | 473 | 467 | - | 327 | 393 | - | |
| Stage 2 | - | - | - | - | - | - | 262 | 349 | - | 460 | 467 | - | |
| Approach | | | | | | | | | | | | | |
| SE | | | NW | | | NE | | | SW | | | | |
| HCM Control Delay, s | 1.8 | | | 0 | | | 35.7 | | | 80.9 | | | |
| HCM LOS | | | | | | | E | | | F | | | |
| Minor Lane/Major Mvmt | | | | | | | | | | | | | |
| NELn1 | | NWL | NWT | NWR | SEL | SET | SERS | SWLn1 | SWLn2 | | | | |
| Capacity (veh/h) | 128 | 1196 | - | - | 744 | - | - | 113 | 383 | | | | |
| HCM Lane V/C Ratio | 0.085 | 0.001 | - | - | 0.102 | - | - | 0.962 | 0.295 | | | | |
| HCM Control Delay (s) | 35.7 | 8 | 0 | - | 10.4 | 0 | - | 146 | 18.3 | | | | |
| HCM Lane LOS | E | A | A | - | B | A | - | F | C | | | | |
| HCM 95th %ile Q(veh) | 0.3 | 0 | - | - | 0.3 | - | - | 6.1 | 1.2 | | | | |

2017 No Build PM Peak

**HCM 2010 TWSC
3: Sam Freeman Rd/SR 60 & SR 124**

4/23/2018

| Intersection | | | | | | | | | | | | |
|----------------------------|-------|-------|------------------------|-------|------|----------------------------|---------------|-------|--------------------------------|-------|-------|-------|
| Int Delay, s/veh | | | | | | | | | | | | |
| Movement | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Traffic Vol, veh/h | 79 | 691 | 4 | 1 | 322 | 128 | 1 | 12 | 1 | 145 | 13 | 72 |
| Future Vol, veh/h | 79 | 691 | 4 | 1 | 322 | 128 | 1 | 12 | 1 | 145 | 13 | 72 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | 125 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 86 | 751 | 4 | 1 | 350 | 139 | 1 | 13 | 1 | 158 | 14 | 78 |
| Major/Minor | | | | | | | | | | | | |
| Major1 | | | Major2 | | | Minor1 | | | Minor2 | | | |
| Conflicting Flow All | 489 | 0 | 0 | 755 | 0 | 0 | 1354 | 1416 | 753 | 1354 | 1349 | 420 |
| Stage 1 | - | - | - | - | - | - | 925 | 925 | - | 422 | 422 | - |
| Stage 2 | - | - | - | - | - | - | 429 | 491 | - | 932 | 927 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1074 | - | - | 855 | - | - | 127 | 137 | 410 | ~127 | 151 | 633 |
| Stage 1 | - | - | - | - | - | - | 323 | 348 | - | 609 | 588 | - |
| Stage 2 | - | - | - | - | - | - | 604 | 548 | - | 320 | 347 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1074 | - | - | 855 | - | - | 91 | 118 | 410 | ~104 | 130 | 633 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 91 | 118 | - | ~104 | 130 | - |
| Stage 1 | - | - | - | - | - | - | 278 | 300 | - | 525 | 587 | - |
| Stage 2 | - | - | - | - | - | - | 516 | 547 | - | 263 | 299 | - |
| Approach | | | | | | | | | | | | |
| SE | | | NW | | | NE | | | SW | | | |
| HCM Control Delay, s | 0.9 | | | 0 | | | 38.7 | | | 270.7 | | |
| HCM LOS | | | | | | | E | | | F | | |
| Minor Lane/Major Mvmt | | | | | | | | | | | | |
| NELn1 | | NWL | NWT | NWR | SEL | SET | SERSWLn1SWLn2 | | | | | |
| Capacity (veh/h) | 122 | 855 | - | - | 1074 | - | - | 106 | 633 | | | |
| HCM Lane V/C Ratio | 0.125 | 0.001 | - | - | 0.08 | - | - | 1.62 | 0.124 | | | |
| HCM Control Delay (s) | 38.7 | 9.2 | 0 | - | 8.6 | 0 | \$ 388.8 | 11.5 | | | | |
| HCM Lane LOS | E | A | A | - | A | A | - | F | B | | | |
| HCM 95th %ile Q(veh) | 0.4 | 0 | - | - | 0.3 | - | - | 13.1 | 0.4 | | | |
| Notes | | | | | | | | | | | | |
| ~- Volume exceeds capacity | | | \$: Delay exceeds 300s | | | *: Computation Not Defined | | | *: All major volume in platoon | | | |

2021 No Build AM Peak

HCM 2010 TWSC

3: Sam Freeman Rd/SR 60 & SR 124

4/23/2018

Intersection

Int Delay, s/veh 29.3

Movement

| | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|-------|
| Traffic Vol, veh/h | 79 | 375 | 3 | 1 | 720 | 235 | 0 | 10 | 1 | 110 | 3 | 118 |
| Future Vol, veh/h | 79 | 375 | 3 | 1 | 720 | 235 | 0 | 10 | 1 | 110 | 3 | 118 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | 125 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 86 | 406 | 3 | 1 | 783 | 255 | 0 | 11 | 1 | 120 | 3 | 128 |

Major/Minor

| | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|----------------------|--------|---|---|--------|---|---|--------|-------|-------|--------|-------|-------|
| Conflicting Flow All | 1038 | 0 | 0 | 411 | 0 | 0 | 1495 | 1621 | 409 | 1500 | 1496 | 910 |
| Stage 1 | - | - | - | - | - | - | 581 | 581 | - | 913 | 913 | - |
| Stage 2 | - | - | - | - | - | - | 914 | 1040 | - | 587 | 583 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 670 | - | - | 1148 | - | - | 101 | 103 | 642 | -100 | 123 | 333 |
| Stage 1 | - | - | - | - | - | - | 499 | 500 | - | 328 | 352 | - |
| Stage 2 | - | - | - | - | - | - | 327 | 307 | - | 496 | 499 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 670 | - | - | 1148 | - | - | 53 | 86 | 642 | -79 | 102 | 333 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 53 | 86 | - | -79 | 102 | - |
| Stage 1 | - | - | - | - | - | - | 416 | 417 | - | 274 | 351 | - |
| Stage 2 | - | - | - | - | - | - | 199 | 306 | - | 402 | 416 | - |

Approach

| | SE | NW | NE | SW |
|----------------------|-----|----|------|-------|
| HCM Control Delay, s | 1.9 | 0 | 49.3 | 203.8 |
| HCM LOS | | | E | F |

Minor Lane/Major Mvmt

| | NELn1 | NWL | NWT | NWR | SEL | SET | SERSWLn1SWLn2 |
|-----------------------|-------|-------|-----|-----|-------|-----|---------------|
| Capacity (veh/h) | 93 | 1148 | - | - | 670 | - | 79 333 |
| HCM Lane V/C Ratio | 0.129 | 0.001 | - | - | 0.128 | - | 1.555 0.385 |
| HCM Control Delay (s) | 49.3 | 8.1 | 0 | - | 11.2 | 0 | \$ 393.3 22.4 |
| HCM Lane LOS | E | A | A | - | 8 | A | - F C |
| HCM 95th %ile Q(veh) | 0.4 | 0 | - | - | 0.4 | - | 10.1 1.8 |

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s -: Computation Not Defined *: All major volume in platoon

2021 No Build PM Peak

**HCM 2010 TWSC
3: Sam Freeman Rd/SR 60 & SR 124**

4/23/2018

| Intersection | | | | | | | | | | | | |
|----------------------------|------------------------|----------------------------|--------------------------------|-------|-------|--------|----------|-------|---------------|----------|-------|-------|
| Int Delay, s/veh | 97.1 | | | | | | | | | | | |
| Movement | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR |
| Traffic Vol, veh/h | 69 | 782 | 5 | 1 | 376 | 145 | 1 | 14 | 1 | 164 | 15 | 82 |
| Future Vol, veh/h | 69 | 782 | 5 | 1 | 376 | 145 | 1 | 14 | 1 | 164 | 15 | 82 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | 125 |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 97 | 850 | 5 | 1 | 409 | 158 | 1 | 15 | 1 | 178 | 16 | 89 |
| Major/Minor | | | | | | | | | | | | |
| Major1 | | | Major2 | | | Minor1 | | | Minor2 | | | |
| Conflicting Flow All | 566 | 0 | 0 | 855 | 0 | 0 | 1544 | 1614 | 853 | 1544 | 1539 | 487 |
| Stage 1 | - | - | - | - | - | - | 1046 | 1046 | - | 490 | 490 | - |
| Stage 2 | - | - | - | - | - | - | 498 | 568 | - | 1054 | 1049 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 1006 | - | - | 785 | - | - | 94 | 104 | 359 | ~94 | 116 | 581 |
| Stage 1 | - | - | - | - | - | - | 276 | 305 | - | 560 | 549 | - |
| Stage 2 | - | - | - | - | - | - | 554 | 506 | - | 273 | 304 | - |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - |
| Mov Cap-1 Maneuver | 1006 | - | - | 785 | - | - | 59 | 85 | 359 | ~70 | 94 | 581 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 59 | 85 | - | ~70 | 94 | - |
| Stage 1 | - | - | - | - | - | - | 225 | 249 | - | 457 | 548 | - |
| Stage 2 | - | - | - | - | - | - | 454 | 505 | - | 209 | 248 | - |
| Approach | | | | | | | | | | | | |
| SE | | | NW | | | NE | | | SW | | | |
| HCM Control Delay, s | 0.9 | | | 0 | | | 56.4 | | | \$ 616.6 | | |
| HCM LOS | | | | | | | F | | | F | | |
| Minor Lane/Major Mvmt | | | | | | | | | | | | |
| NELn1 | | | NWL | | | NWT | | | SERSWLn1SWLn2 | | | |
| Capacity (veh/h) | 87 | 785 | - | - | 1006 | - | - | 72 | 581 | | | |
| HCM Lane V/C Ratio | 0.2 | 0.001 | - | - | 0.096 | - | - | 2.702 | 0.153 | | | |
| HCM Control Delay (s) | 56.4 | 9.6 | 0 | - | 9 | 0 | \$ 893.5 | 12.3 | | | | |
| HCM Lane LOS | F | A | A | - | A | A | - | F | B | | | |
| HCM 95th %ile Q(veh) | 0.7 | 0 | - | - | 0.3 | - | - | 19.1 | 0.5 | | | |
| Notes | | | | | | | | | | | | |
| -: Volume exceeds capacity | \$: Delay exceeds 300s | +: Computation Not Defined | -: All major volume in platoon | | | | | | | | | |

2041 No Build AM Peak

HCM 2010 TWSC

3: Sam Freeman Rd/SR 60 & SR 124

4/23/2018

| Intersection | | | | | | | | | | | | | | | |
|----------------------------|------------------------|----------------------------|--------------------------------|-------|--------|------|-------|--------|-------|-------|-------|-------|---|--|--|
| Int Delay, s/veh | 1.4 | | | | | | | | | | | | | | |
| Movement | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SWR | | | |
| Traffic Vol, veh/h | 147 | 697 | 6 | 2 | 1338 | 438 | 0 | 19 | 2 | 204 | 6 | 219 | | | |
| Future Vol, veh/h | 147 | 697 | 6 | 2 | 1338 | 438 | 0 | 19 | 2 | 204 | 6 | 219 | | | |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop | | | |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield | | | |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | 125 | | | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | | | |
| Grade, % | - | 0 | - | - | 0 | - | - | - | - | - | 0 | - | | | |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | | | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | |
| Mvmt Flow | 160 | 758 | 7 | 2 | 1454 | 476 | 0 | 21 | 2 | 222 | 7 | 238 | | | |
| Major/Minor | | | | | | | | | | | | | | | |
| Major1 | | Major2 | | | Minor1 | | | Minor2 | | | | | | | |
| Conflicting Flow All | 1930 | 0 | 0 | 764 | 0 | 0 | 2780 | 3015 | 761 | 2789 | 2781 | 1692 | | | |
| Stage 1 | - | - | - | - | - | - | 1080 | 1080 | - | 1697 | 1697 | - | | | |
| Stage 2 | - | - | - | - | - | - | 1700 | 1935 | - | 1092 | 1084 | - | | | |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | | | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | | | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | | | |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | | | |
| Pol Cap-1 Maneuver | 305 | - | - | 849 | - | - | 12 | -13 | 405 | -12 | 19 | -115 | | | |
| Stage 1 | - | - | - | - | - | - | 264 | 294 | - | -117 | 148 | - | | | |
| Stage 2 | - | - | - | - | - | - | 117 | 113 | - | 260 | 293 | - | | | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | - | - | | | |
| Mov Cap-1 Maneuver | 305 | - | - | 849 | - | - | - | -1 | 405 | - | -2 | -115 | | | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | -1 | - | - | -2 | - | | | |
| Stage 1 | - | - | - | - | - | - | 23 | 26 | - | -10 | 148 | - | | | |
| Stage 2 | - | - | - | - | - | - | - | 113 | - | -5 | 25 | - | | | |
| Approach | | | | | | | | | | | | | | | |
| SE | | | NW | | | NE | | | SW | | | | | | |
| HCM Control Delay, s | 5 | - | - | 0 | - | - | - | - | - | - | - | - | - | | |
| HCM LOS | - | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Minor Lane/Major Mvmt | | | | | | | | | | | | | | | |
| NELn1 | | NWL | NWT | NWR | SEL | SET | SER | SWLn1 | SWLn2 | | | | | | |
| Capacity (veh/h) | - | 849 | - | - | 305 | - | - | - | 115 | | | | | | |
| HCM Lane VIC Ratio | - | 0.003 | - | - | 0.524 | - | - | - | 2.07 | | | | | | |
| HCM Control Delay (s) | - | 9.3 | 0 | - | 29.1 | 0 | - | - | 572.2 | | | | | | |
| HCM Lane LOS | - | A | A | - | D | A | - | - | F | | | | | | |
| HCM 95th %ile Q(veh) | - | 0 | - | - | 2.9 | - | - | - | 19.9 | | | | | | |
| Notes | | | | | | | | | | | | | | | |
| -: Volume exceeds capacity | \$: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon | | | | | | | | | | | | |

2041 No Build PM Peak

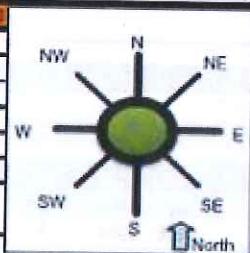
HCM 2010 TWSC
3: Sam Freeman Rd/SR 60 & SR 124

4/27/2018

| Intersection | | | | | | | | | | | | | |
|----------------------------|-------|------------------------|------|-------|----------------------------|------|-------|--------------------------------|-------|-------|-------|-------|--|
| Int Delay, s/veh | 0.7 | | | | | | | | | | | | |
| Movement | SEL | SET | SER | NWL | NWT | NWR | NEL | NET | NER | SWL | SWT | SNR | |
| Traffic Vol, veh/h | 166 | 1454 | 8 | 2 | 699 | 269 | 2 | 25 | 2 | 305 | 27 | 152 | |
| Future Vol, veh/h | 166 | 1454 | 8 | 2 | 699 | 269 | 2 | 25 | 2 | 305 | 27 | 152 | |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop | |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | Yield | |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | 125 | |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - | |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Mvmt Flow | 180 | 1580 | 9 | 2 | 760 | 292 | 2 | 27 | 2 | 332 | 29 | 165 | |
| Major/Minor | | | | | | | | | | | | | |
| Major1 | | Major2 | | | Minor1 | | | Minor2 | | | | | |
| Conflicting Flow All | 1052 | 0 | 0 | 1589 | 0 | 0 | 2871 | 3003 | 1585 | 2870 | 2860 | 906 | |
| Stage 1 | - | - | - | - | - | - | 1946 | 1946 | - | 910 | 910 | - | |
| Stage 2 | - | - | - | - | - | - | 925 | 1057 | - | 1960 | 1950 | - | |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 | |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - | |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 | |
| Pot Cap-1 Maneuver | 662 | - | - | 413 | - | - | 10 | -14 | 133 | -10 | -17 | 334 | |
| Stage 1 | - | - | - | - | - | - | 84 | 111 | - | 329 | 353 | - | |
| Stage 2 | - | - | - | - | - | - | 323 | 302 | - | -82 | 111 | - | |
| Platoon blocked, % | - | - | - | - | - | - | - | - | - | - | 0 | 334 | |
| Mov Cap-1 Maneuver | 662 | - | - | 413 | - | - | - | 0 | 133 | - | 0 | - | |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | - | 0 | - | -329 | 348 | - | |
| Stage 1 | - | - | - | - | - | - | 84 | 0 | - | - | 0 | - | |
| Stage 2 | - | - | - | - | - | - | 148 | 298 | - | - | 0 | - | |
| Approach | | | | | | | | | | | | | |
| SE | | NW | | | NE | | | SW | | | | | |
| HCM Control Delay, s | 1.3 | | 0 | | | - | | | - | | | | |
| HCM LOS | | | | | | | | | | | | | |
| Minor Lane/Major Mvmt | | NELn1 | NWL | NWT | NWR | SEL | SET | SERS | WLn1 | SWLn2 | | | |
| Capacity (veh/h) | - | 413 | - | - | 662 | - | - | - | - | 334 | | | |
| HCM Lane V/C Ratio | - | 0.005 | - | - | 0.273 | - | - | - | - | 0.495 | | | |
| HCM Control Delay (s) | - | 13.8 | 0 | - | 12.5 | 0 | - | - | - | 25.9 | | | |
| HCM Lane LOS | - | B | A | - | B | A | - | - | - | D | | | |
| HCM 95th %tile Q(veh) | - | 0 | - | - | 1.1 | - | - | - | - | 2.6 | | | |
| Notes | | | | | | | | | | | | | |
| -: Volume exceeds capacity | | \$: Delay exceeds 300s | | | +: Computation Not Defined | | | *: All major volume in platoon | | | | | |

Appendix G: Roundabout Analysis (Build & Design Years) – GDOT Tool (v4.1)

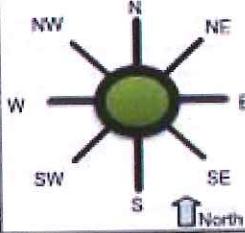
Roundabout Analysis Tool
Single Lane5/2/2018
Version 4.1

| General & Site Information | | | | | | | | v 4.1 | | | | | | | |
|--|------------------------------------|--------|-------|--------|--------|--------|-------|--------|--|--|--|--|--|--|--|
| Analyst: | Matt Boyd | | | | | | | | | | | | | | |
| Agency/Co: | Atkins | | | | | | | | | | | | | | |
| Date: | 4/16/2018 | | | | | | | | | | | | | | |
| Project or Pill: | SR 124 at SR 60 | | | | | | | | | | | | | | |
| Year, Peak Hour: | 2021 AM Peak | | | | | | | | | | | | | | |
| County/District: | Jackson County, GDOT District 1 | | | | | | | | | | | | | | |
| Intersection Name: | SR-124 at SR 60 and Sam Freeman Rd | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | |
| Volumes | | | | | | | | | | | | | | | |
| | Entry Legs (FROM) | | | | | | | | | | | | | | |
| | N (1), vph | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) | | | | | | | |
| Exit Legs (TO) | N (1), vph | 0 | 243 | 11 | | 82 | | | | | | | | | |
| Legs | NE (2), vph | | | | | | | | | | | | | | |
| (TO) | E (3), vph | 133 | 0 | 1 | | 386 | | | | | | | | | |
| | SE (4), vph | | | | | | | | | | | | | | |
| | S (5), vph | 4 | 1 | 0 | | 4 | | | | | | | | | |
| | SW (6), vph | | | | | | | | | | | | | | |
| | W (7), vph | 121 | 743 | 0 | | 0 | | | | | | | | | |
| | NW (8), vph | | | | | | | | | | | | | | |
| Output | Total Vehicles | 238 | 0 | 987 | 0 | 12 | 0 | 472 | | | | | | | |
| Volume Characteristics | | | | | | | | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW | | | | | | | |
| % Cars | 93.8% | 100.0% | 96.3% | 100.0% | 100.0% | 100.0% | 96.3% | 100.0% | | | | | | | |
| % Heavy Vehicles | 6.2% | 0.0% | 3.7% | 0.0% | 0.0% | 0.0% | 3.7% | 0.0% | | | | | | | |
| % Bicycle | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | | | | | |
| # of Pedestrians (ped/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.50 | 0.95 | 0.81 | 0.95 | | | | | | | |
| F _{av} | 0.942 | 1.000 | 0.964 | 1.000 | 1.000 | 1.000 | 0.964 | 1.000 | | | | | | | |
| F _{act} | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | | | | | | | |
| Entry/Conflicting Flows | | | | | | | | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW | | | | | | | |
| Flow to Leg # N (1), pcu/h | 0 | 0 | 265 | 0 | 22 | 0 | 105 | 0 | | | | | | | |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| E (3), pcu/h | 141 | 0 | 0 | 0 | 2 | 0 | 494 | 0 | | | | | | | |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| S (5), pcu/h | 5 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | | | | | | | |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| W (7), pcu/h | 151 | 0 | 811 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| Entry flow, pcu/h | 297 | 0 | 1077 | 0 | 24 | 0 | 604 | 0 | | | | | | | |
| Conflicting flow, pcu/h | 812 | 0 | 127 | 0 | 740 | 0 | 147 | 0 | | | | | | | |
| Results: Approach Measures of Effectiveness | | | | | | | | | | | | | | | |
| HCM 6th Edition | | | | | | | | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW | | | | | | | |
| Entry Capacity, vph | 568 | NA | 1169 | NA | 649 | NA | 1145 | NA | | | | | | | |
| Entry Flow Rates, vph | 280 | NA | 1039 | NA | 24 | NA | 583 | NA | | | | | | | |
| V/C ratio | 0.49 | 0.89 | | 0.04 | | 0.51 | | | | | | | | | |
| Control Delay, sec/pcu | 15 | | 26 | | 6 | | 9 | | | | | | | | |
| LOS | B | | D | | A | | A | | | | | | | | |
| 95th % Queue (ft) | 72 | | 343 | | 3 | | 77 | | | | | | | | |
| Notes: | v 4.0 | | | | | | | | | | | | | | |



Roundabout Analysis Tool
Single Lane

5/2/2018
Version 4.1

| General & Site Information | | | | | | | | | | | | | | | |
|--|-------------------|------------------------------------|-------|--------|--------|--------|-------|--------|--|--|--|--|--|--|--|
| Analyst: | | Matt Boyd | | | | | | | | | | | | | |
| Agency/Co: | | Atkins | | | | | | | | | | | | | |
| Date: | | 4/17/2018 | | | | | | | | | | | | | |
| Project or PW: | | SR 124 at SR 60 | | | | | | | | | | | | | |
| Year, Peak Hour: | | 2021 PM Peak | | | | | | | | | | | | | |
| County/District: | | Jackson County, GDOT District 1 | | | | | | | | | | | | | |
| Intersection: | | SR-124 at SR 60 and Sam Freeman Rd | | | | | | | | | | | | | |
| Name: | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | |
| Volumes | | | | | | | | | | | | | | | |
| | Entry Legs (FROM) | | | | | | | | | | | | | | |
| | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) | | | | | | | |
| Exit | N (1), vph | 0 | | 149 | | 14 | | 92 | | | | | | | |
| Legs (TO) | NE (2), vph | | | | | | | | | | | | | | |
| | E (3), vph | 169 | | 0 | | 1 | | 807 | | | | | | | |
| | SE (4), vph | | | | | | | | | | | | | | |
| | S (5), vph | 15 | | 1 | | 0 | | 5 | | | | | | | |
| | SW (6), vph | | | | | | | | | | | | | | |
| | W (7), vph | 84 | | 376 | | 1 | | 7 | | | | | | | |
| | NW (8), vph | | | | | | | | | | | | | | |
| Output | Total Vehicles | 268 | 0 | 526 | 0 | 16 | 0 | 911 | | | | | | | |
| Volume Characteristics | | | | | | | | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW | | | | | | | |
| % Cars | 93.8% | 100.0% | 96.3% | 100.0% | 100.0% | 100.0% | 96.3% | 100.0% | | | | | | | |
| % Heavy Vehicles | 6.2% | 0.0% | 3.7% | 0.0% | 0.0% | 0.0% | 3.7% | 0.0% | | | | | | | |
| % Bicycle | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | | | | | |
| # of Pedestrians (ped/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| RPH | 0.86 | 0.95 | 0.87 | 0.95 | 0.70 | 0.95 | 0.96 | 0.95 | | | | | | | |
| F _{flow} | 0.942 | 1.000 | 0.964 | 1.000 | 1.000 | 1.000 | 0.964 | 1.000 | | | | | | | |
| F _{conflict} | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | | | | | | | |
| Entry/Conflicting Flows | | | | | | | | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW | | | | | | | |
| Flow to Leg # N (1), pcu/h | 0 | 0 | 178 | 0 | 20 | 0 | 99 | 0 | | | | | | | |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| E (3), pcu/h | 209 | 0 | 0 | 0 | 1 | 0 | 872 | 0 | | | | | | | |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| S (5), pcu/h | 19 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | | | | | | | |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| W (7), pcu/h | 104 | 0 | 448 | 0 | 1 | 0 | 8 | 0 | | | | | | | |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| Entry flow, pcu/h | 331 | 0 | 627 | 0 | 23 | 0 | 584 | 0 | | | | | | | |
| Conflicting flow, pcu/h | 458 | 0 | 128 | 0 | 1187 | 0 | 228 | 0 | | | | | | | |
| Results: Approach Measures of Effectiveness | | | | | | | | | | | | | | | |
| HCM 6th Edition | N | NE | E | SE | S | SW | W | NW | | | | | | | |
| Entry Capacity, vph | 814 | NA | 1167 | NA | 411 | NA | 1054 | NA | | | | | | | |
| Entry Flow Rates, vph | 312 | NA | 605 | NA | 23 | NA | 949 | NA | | | | | | | |
| V/C ratio | 0.38 | | 0.52 | | 0.06 | | 0.90 | | | | | | | | |
| Control Delay, sec/pcu | 9 | | 9 | | 10 | | 29 | | | | | | | | |
| LOS | A | | A | | A | | D | | | | | | | | |
| 95th % Queue (ft) | 48 | | 80 | | 4 | | 347 | | | | | | | | |
| Notes: | | | | | | | | | | | | | | | |

Georgia Department of Transportation
Office of Traffic Operations


 Roundabout Analysis Tool
 Single Lane

 5/2/2018
 Version 4.1

| General & Site Information v 4.1 | | | | | | | | |
|---|------------------------------------|--------|-------|--------|--------|--------|-------|--------|
| Analyst: | Matt Boyd | | | | | | | |
| Agency/Co: | Atkins | | | | | | | |
| Date: | 4/17/2018 | | | | | | | |
| Project or Ph#: | SR 124 at SR 60 | | | | | | | |
| Year, Peak Hour: | 2041 AM Peak | | | | | | | |
| County/District: | Jackson County, GDOT District 1 | | | | | | | |
| Intersection Name: | SR-124 at SR 60 and Sam Freeman Rd | | | | | | | |
| Volumes | | | | | | | | |
| | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
| Exit NE (2), vph | 0 | | 438 | | 19 | | 147 | |
| Legs E (3), vph | 204 | | 0 | | 2 | | 697 | |
| (TO) SE (4), vph | | | | | | | | |
| S (5), vph | 6 | | 2 | | 0 | | 6 | |
| SW (6), vph | | | | | | | | |
| W (7), vph | 219 | | 1338 | | 0 | | 0 | |
| NW (8), vph | | | | | | | | |
| Output Total Vehicles | 429 | 0 | 1778 | 0 | 21 | 0 | 850 | 0 |
| Volume Characteristics | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW |
| % Cars | 93.8% | 100.0% | 96.3% | 100.0% | 100.0% | 100.0% | 96.3% | 100.0% |
| % Heavy Vehicles | 6.2% | 0.0% | 3.7% | 0.0% | 0.0% | 0.0% | 3.7% | 0.0% |
| % Bicycle | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| # of Pedestrians (ped/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PHF | 0.85 | 0.95 | 0.95 | 0.95 | 0.50 | 0.95 | 0.81 | 0.95 |
| Fav | 0.942 | 1.000 | 0.964 | 1.000 | 1.000 | 1.000 | 0.964 | 1.000 |
| Fout | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Entry/Conflicting Flows | | | | | | | | |
| | N | NE | E | SE | S | SW | W | NW |
| Flow to Leg # N (1), pcu/h | 0 | 0 | 478 | 0 | 38 | 0 | 188 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 255 | 0 | 0 | 0 | 4 | 0 | 892 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 7 | 0 | 2 | 0 | 0 | 0 | 8 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 274 | 0 | 1461 | 0 | 0 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 536 | 0 | 1941 | 0 | 42 | 0 | 1088 | 0 |
| Conflicting flow, pcu/h | 1463 | 0 | 226 | 0 | 1335 | 0 | 265 | 0 |
| Results: Approach Measures of Effectiveness | | | | | | | | |
| HCM 6th Edition | N | NE | E | SE | S | SW | W | NW |
| Entry Capacity, vph | 292 | NA | 1057 | NA | 353 | NA | 1016 | NA |
| Entry Flow Rates, vph | 505 | NA | 1872 | NA | 42 | NA | 1049 | NA |
| V/C ratio | 1.73 | | 1.77 | | 0.12 | | 1.03 | |
| Control Delay, sec/pcu | 371 | | 363 | | 12 | | 57 | |
| LOS | F | | F | | B | | F | |
| 95th % Queue (ft) | 860 | | 2809 | | 10 | | 571 | |
| Notes: | v 4.0 | | | | | | | |



Roundabout Analysis Tool
Single Lane

5/2/2018
Version 4.1

| General & Site Information | | | | | | | | | | | | | |
|---|----------------|------------------------------------|--------|-------|--------|--------|--------|--|--|--|--|--|--|
| Analyst: | | Matt Boyd | | | | | | | | | | | |
| Agency/Co: | | Atkins | | | | | | | | | | | |
| Date: | | 4/17/2018 | | | | | | | | | | | |
| Project or PII: | | SR 124 at SR 60 | | | | | | | | | | | |
| Year, Peak Hour: | | 2041 PM Peak | | | | | | | | | | | |
| County/District: | | Jackson County, GDOT District 1 | | | | | | | | | | | |
| Intersection Name: | | SR-124 at SR 60 and Sam Freeman Rd | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Volumes | | | | | | | | | | | | | |
| | | Entry Legs (FROM) | | | | | | | | | | | |
| | | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | | | | | | |
| Exit Legs (TO) | N (1), vph | 0 | | 269 | | 25 | | | | | | | |
| | NE (2), vph | | | | | | | | | | | | |
| | E (3), vph | 305 | | 0 | | 2 | | | | | | | |
| | SE (4), vph | | | | | | | | | | | | |
| | S (5), vph | 27 | | 2 | | 0 | | | | | | | |
| | SW (6), vph | | | | | | | | | | | | |
| | W (7), vph | 152 | | 678 | | 2 | | | | | | | |
| | NW (8), vph | | | | | | | | | | | | |
| Output | Total Vehicles | 484 | 0 | 949 | 0 | 29 | 0 | | | | | | |
| | | | | | | 1641 | 0 | | | | | | |
| Volume Characteristics | | | | | | | | | | | | | |
| | | N | NE | E | SE | S | SW | | | | | | |
| % Cars | | 93.8% | 100.0% | 96.3% | 100.0% | 100.0% | 100.0% | | | | | | |
| % Heavy Vehicles | | 6.2% | 0.0% | 3.7% | 0.0% | 0.0% | 0.0% | | | | | | |
| % Bicycle | | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | | | | |
| # of Pedestrians (ped/hr) | | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| PHF | | 0.86 | 0.95 | 0.87 | 0.95 | 0.70 | 0.95 | | | | | | |
| Fav | | 0.942 | 1.000 | 0.964 | 1.000 | 1.000 | 1.000 | | | | | | |
| Fall | | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | | | | | | |
| Entry/Conflicting Flows | | | | | | | | | | | | | |
| | | N | NE | E | SE | S | SW | | | | | | |
| Flow to Leg # N (1), pcu/h | | 0 | 0 | 321 | 0 | 36 | 0 | | | | | | |
| NE (2), pcu/h | | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| E (3), pcu/h | | 377 | 0 | 0 | 0 | 3 | 0 | | | | | | |
| SE (4), pcu/h | | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| S (5), pcu/h | | 33 | 0 | 2 | 0 | 0 | 0 | | | | | | |
| SW (6), pcu/h | | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| W (7), pcu/h | | 188 | 0 | 808 | 0 | 3 | 0 | | | | | | |
| NW (8), pcu/h | | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| Entry Flow, pcu/h | | 598 | 0 | 1131 | 0 | 41 | 0 | | | | | | |
| Conflicting Flow, pcu/h | | 827 | 0 | 232 | 0 | 2141 | 0 | | | | | | |
| v 4.0 | | | | | | | | | | | | | |
| Results: Approach Measures of Effectiveness | | | | | | | | | | | | | |
| HCM 6th Edition | N | NE | E | SE | S | SW | W | | | | | | |
| Entry Capacity, vph | 559 | NA | 1050 | NA | 155 | NA | 874 | | | | | | |
| Entry Flow Rates, vph | 563 | NA | 1091 | NA | 41 | NA | 1709 | | | | | | |
| V/C ratio | 1.01 | | 1.04 | | 0.27 | | 1.96 | | | | | | |
| Control Delay, sec/pcu | 67 | | 58 | | 33 | | 448 | | | | | | |
| LOS | F | | F | | D | | F | | | | | | |
| 95th % Queue (ft) | 392 | | 594 | | 25 | | 2858 | | | | | | |
| Notes: | | | | | | | | | | | | | |

Georgia Department of Transportation
Office of Traffic Operations



Roundabout Analysis Tool
Multi-Lane

5/2/2018
Version 4.1

| General & Site Information | | | | | | | | | | | | | | | | |
|---|------------------------------------|----------|---------|---------|---------|-----------|------------|---------|---------|--|--|--|--|--|--|--|
| Analyst: | Matt Boyd | | | | | | | | | | | | | | | |
| Agency/Co: | Atkins | | | | | | | | | | | | | | | |
| Date: | 4/16/2018 | | | | | | | | | | | | | | | |
| Project or PI#: | SR 124 at SR 60 | | | | | | | | | | | | | | | |
| Year, Peak Hour: | 2021 AM Peak | | | | | | | | | | | | | | | |
| County/District: | Jackson County, GDOT District 1 | | | | | | | | | | | | | | | |
| Intersection: | SR-124 at SR 60 and Sam Freeman Rd | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| Volumes | | | | | | | | | | | | | | | | |
| Entry Legs (FROM) | | | | | | | | | | | | | | | | |
| | | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) | | | | | | | |
| Lane Designation | | Lf-Th-Rt | No Lane | No Lane | No Lane | Left-Thru | Right-Thru | No Lane | No Lane | | | | | | | |
| Exit Legs (TO) | N (1), vph | 0 | | | | 0 | 243 | | | | | | | | | |
| | NE (2), vph | | | | | | | | | | | | | | | |
| | E (3), vph | 113 | | | | 0 | 0 | | | | | | | | | |
| | SE (4), vph | | | | | | | | | | | | | | | |
| | S (5), vph | 4 | | | | 1 | 0 | | | | | | | | | |
| | SW (6), vph | | | | | | | | | | | | | | | |
| | W (7), vph | 0 | | | | 492 | 251 | | | | | | | | | |
| | NW (8), vph | | | | | | | | | | | | | | | |
| Entry Volume, vph | | 117 | 0 | 0 | 0 | 493 | 494 | 0 | 0 | | | | | | | |
| S1 (5) S2 (5) SW1 (6) SW2 (6) W1 (7) W2 (7) NW1 (8) NW2 (8) | | | | | | | | | | | | | | | | |
| Lane Designation | | Lf-Th-Rt | No Lane | No Lane | No Lane | Left-Thru | Right-Thru | No Lane | No Lane | | | | | | | |
| Entry Volume, vph | N (1), vph | 11 | | | | 82 | 0 | | | | | | | | | |
| | NE (2), vph | | | | | | | | | | | | | | | |
| | E (3), vph | 1 | | | | 154 | 232 | | | | | | | | | |
| | SE (4), vph | | | | | | | | | | | | | | | |
| | S (5), vph | 0 | | | | 0 | 4 | | | | | | | | | |
| | SW (6), vph | | | | | | | | | | | | | | | |
| | W (7), vph | 0 | | | | 0 | 0 | | | | | | | | | |
| | NW (8), vph | | | | | | | | | | | | | | | |

