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By: Daniel Torres, P.E.  
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El Paso County Department of Public Works  
Development Services



# FALCON RESERVE

PCD FILE No. SP252 & P255 SF2617

## TRAFFIC IMPACT STUDY

Prepared for:

El Paso County, CO

Prepared by:



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On Behalf of:

The Landhuis Company  
212 N. Wahsatch Avenue Suite 301  
Colorado Spring, CO 80903

Please update for the  
reduction of lots in the  
final plat.

### Traffic Engineer's Statement

The attached Traffic Report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

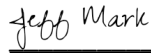
  
\_\_\_\_\_  
Navid Shafieirad, P.E. #66350

09/30/2025

Date

### Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

  
\_\_\_\_\_  
Signer ID: 8D4OBF8M15...  
Jeff Mark, President

09/30/2025 PDT

Date

The Landhuis Company

212 N. Wahsatch Avenue, Suite 301

Colorado Springs, CO 80903

September 30, 2025

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# Introduction

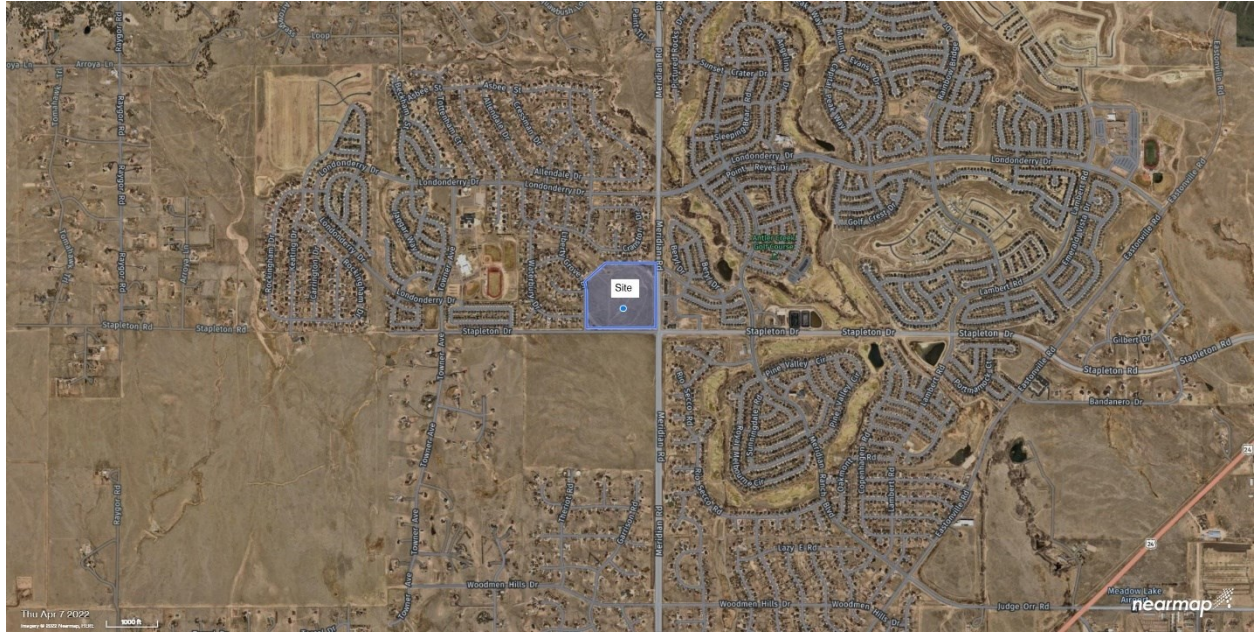
Falcon reserve (The Project) is a proposed 37.9-acre development located at the northwest corner of Meridian Road/Stapleton Drive in unincorporated El Paso County. The project consists of 160 single-family detached dwelling units.

The purpose of this study is to assess the effects this proposed development will have on the surrounding transportation.

The report is organized as follows:

- **Introduction** – Describes the purpose and intent of this study.
- **Area Conditions** – Describes the study area land uses as well as the existing and future roadway network.
- **Proposed Development** – Describes the proposed development and the location.
- **Projected Traffic** – Identifies the expected number of daily and peak hour trips that will be generated by the Falcon reserve. The expected external trip distribution is also shown.
- **Traffic Analysis** – Analyzes the existing conditions in the study area as well as buildout year (2028) and horizon year (2045) conditions with and without the project.
- **Findings and Conclusions** – Identifies any deficiencies in the study area roadway network with or without the project and mitigation measures that will alleviate any identified deficiencies.
- **Recommendations** – Provides a summary of the study findings.

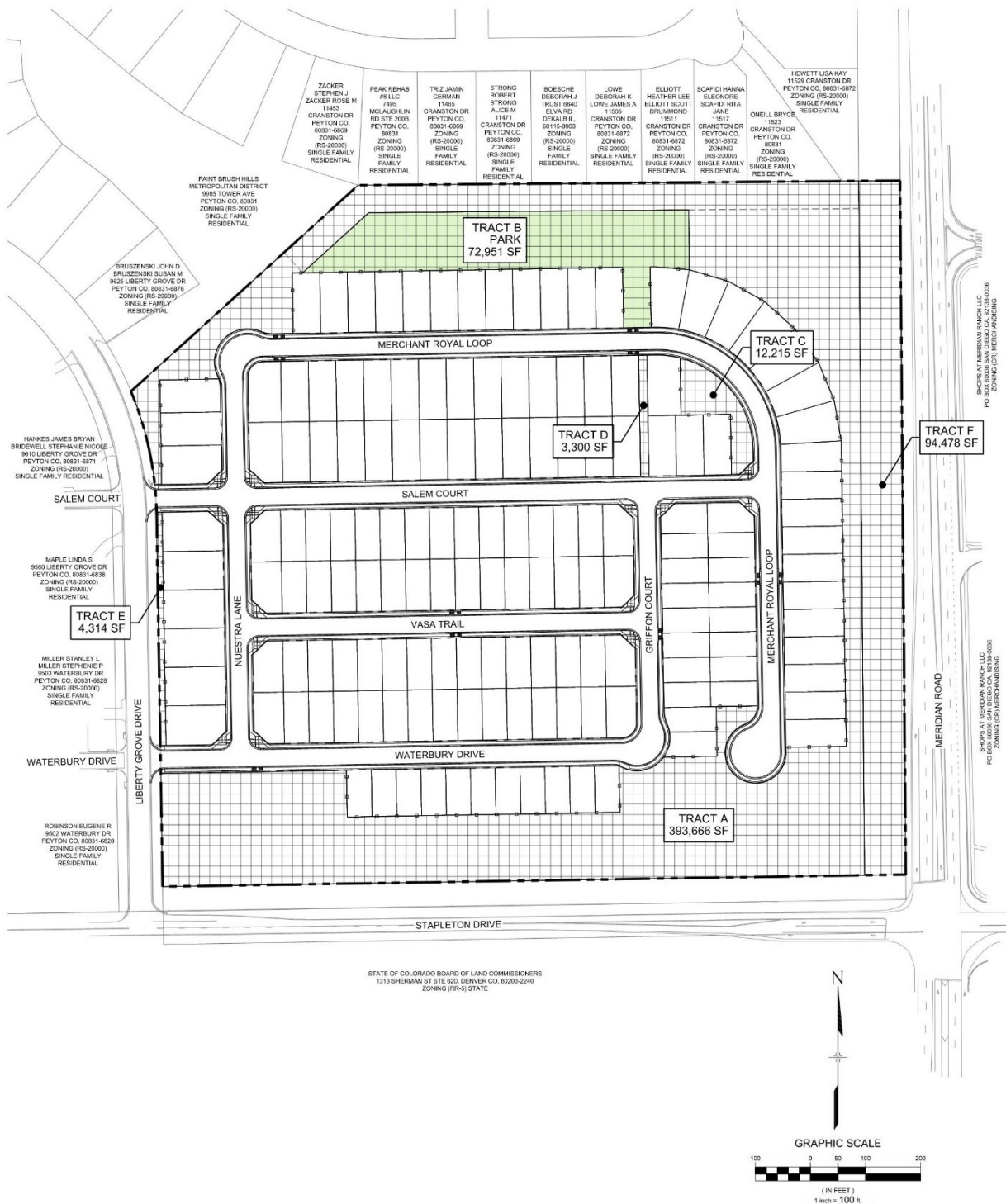
**Figure 1. Vicinity Map**



## Proposed Development

Falcon Reserve will consist of 160 single-family detached housing units. Figure 2 shows the project's site plan.

Figure 2. Falcon Reserve Site Plan



## Area Conditions

This section describes the existing conditions and the planned level of improvements adjacent to the Falcon Reserve development.

## Study Area Land Use

Falcon Reserve development will be constructed on vacant land and is bounded on the west by Liberty Grove Drive, on the south by Stapleton Drive, and on the east by Meridian Road.

## Site Accessibility

The existing roadway system consists of the following transportation facilities:

**Meridian Road** is a north-south street that provides two lanes in each direction. Meridian Road is classified as a 4-lane urban principal arterial in the 2045 El Paso County (EPC) Major Transportation Corridors Plan (MTCP). Each direction on this arterial road is separated by a median. Sidewalk is provided along the east side of Meridian Road Starting at Stapleton Drive continuing north. The Average Daily Traffic (ADT) threshold capacity for this road is 40,000 vehicles. Meridian Road south of Stapleton Drive is classified as a 6-lane urban principal road in the 2065 El Paso County Corridor Preservation Plan. The posted speed limit is 55 miles-per-hour (mph) on this facility.

**Stapleton Drive** is an east-west street and is classified as a 4-lane urban principal arterial in the 2045 MTCP west of Meridian Road. This roadway is classified as a 4-lane principal arterial for the entire study area in the 2065 MTCP corridor preservation plan. This road currently provides one lane in each direction. A paved shoulder is provided along the eastbound direction. This facility does not provide a sidewalk, but detached sidewalk is anticipated on this roadway according to the Briargate Parkway/Stapleton Drive Corridor Study. The ADT threshold capacity for this road is 40,000 vehicles. The posted speed limit is 45 mph on this roadway.

**Liberty Grove Drive** is a north-south local road along the west side of the vacant land connecting Stapleton Drive to Londonderry Drive. Liberty Grove Drive provides one lane in each direction. No sidewalk is provided along this Road. The ADT threshold capacity for this road is 3,000 vehicles. The posted speed limit is 25 mph on this roadway. The Falcon Reserve will include a standard sidewalk along its Liberty Grove frontage. Sight triangles are included in Appendix F – Supporting Documents.

**Londonderry Drive** is an east-west 2-lane urban major collector as shown in the 2045 and 2065 MTCP. Londonderry Drive provides one lane in each direction and a two-way left-turn lane in the median. There are unpaved trails along both sides of the street. The ADT threshold capacity for this road is 10,000 vehicles. The posted speed limit is 35 mph on this roadway.

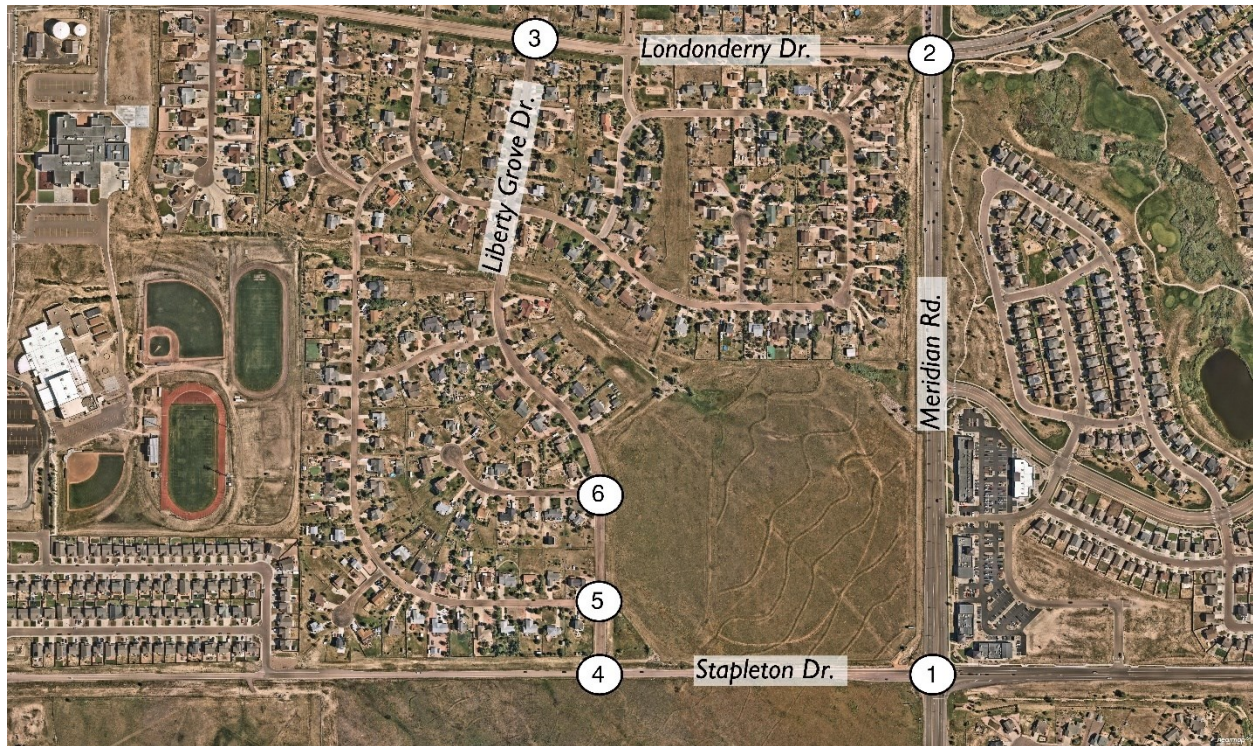
The construction of the project will help to improve the continuity of sidewalk, curb, and gutter along Liberty Grove. Stapleton Road sidewalk is anticipated in the Briargate Parkway/Stapleton Road Corridor Preservation Plan Study.

Traffic counts were collected on April 2, 2024, and the studied intersections were confined to intersections listed below:

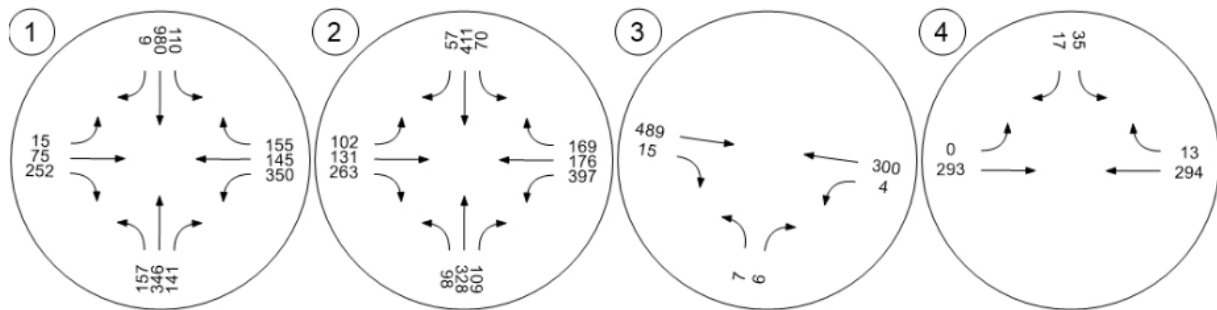
- Meridian Road/Stapleton Drive
- Meridian Road/Londonderry Drive
- Liberty Grove Drive/Stapleton Drive
- Liberty Grove Drive/Waterbury Drive
- Liberty Grove Drive/Salem Court
- Liberty Grove Drive/Londonderry Drive

The AM and PM peak hour volumes at these intersections are shown in Figure 3 and Figure 4. The daily traffic is shown in Figure 5. The intersection configurations are shown in Figure 6.

**Figure 3. Existing Conditions Traffic Volumes (AM Peak Hour)**



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

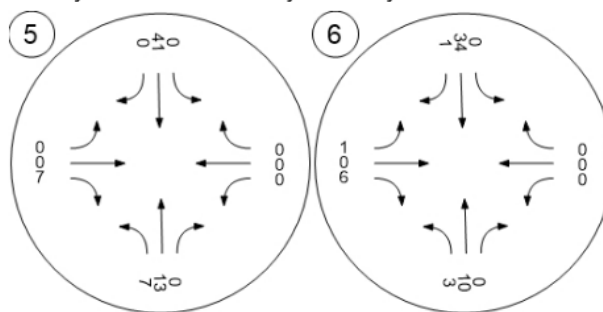
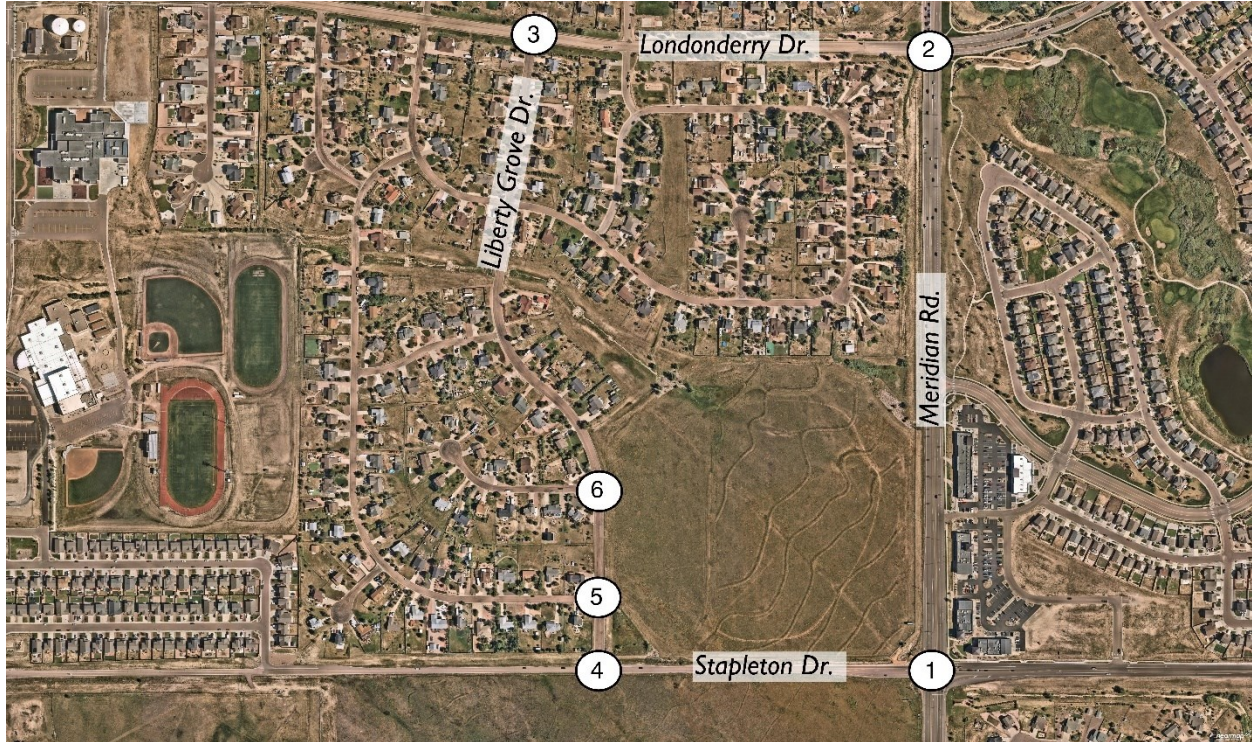




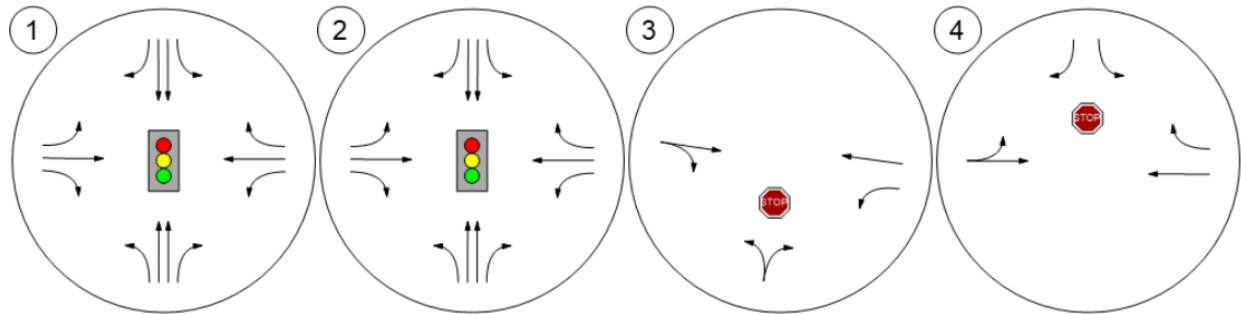
Figure 5. Existing Conditions Daily Traffic Volumes and Roadway Classification



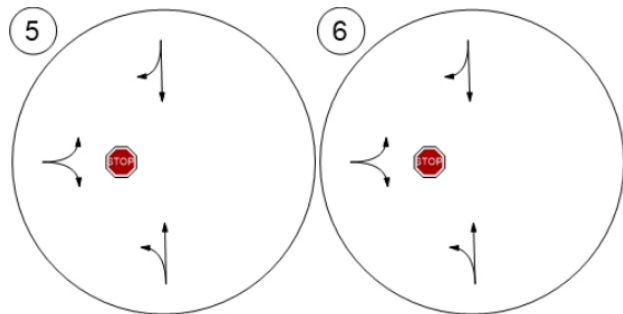
**Figure 6. Existing Conditions Intersection Configurations**



Meridian Road/Stapleton Dr   Meridian Rd/Londonderry Dr   Londonderry Dr/Liberty Grov   Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury   Liberty Grove Dr/Salem Ct



The intersection operations are shown in Tables 1 and 2.

**Table 1. Existing Conditions Intersection Operations (AM Peak Hour)****Intersection Analysis Summary**

| ID | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | WB Left    | 0.725 | 60.2          | E   |
| 2  | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | WB Left    | 0.607 | 52.8          | D   |
| 3  | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.066 | 23.2          | C   |
| 4  | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | SB Left    | 0.140 | 16.9          | C   |
| 5  | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Right   | 0.008 | 8.6           | A   |
| 6  | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.002 | 9.0           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Table 2. Existing Conditions Intersection Operations (PM Peak Hour)****Intersection Analysis Summary**

| ID | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | WB Left    | 0.569 | 28.6          | C   |
| 2  | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | WB Left    | 0.392 | 17.0          | B   |
| 3  | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.011 | 10.9          | B   |
| 4  | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | SB Left    | 0.052 | 11.6          | B   |
| 5  | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Right   | 0.009 | 8.5           | A   |
| 6  | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.007 | 9.0           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Acceptable operations are defined as any intersection that operates at LOS D or better. Tables 1 and 2 indicate all study area intersections operate at an acceptable level-of-service except for Meridian Road and Stapleton Drive (#1) which operate at LOS E during the AM peak hour. A new signal timing has been proposed by Matrix which improves the level of service to LOS B at this intersection. The mitigated scenario is located in Appendix B – Existing Conditions labeled as *Mitigated*. The daily traffic volumes

along all area roadways are well below the threshold for their classifications. Turn lane evaluations for the existing conditions are summarized in Table 3, below.

**Table 3. Existing Conditions Turn Lane Evaluations**

| ID | Intersection                       | Movement | Turning Volume (vph) | Queue (ft) | Deceleration (ft) | Taper (ft) | Storage (ft) | Total (ft) | Provided (ft) | Notes                                                                               |
|----|------------------------------------|----------|----------------------|------------|-------------------|------------|--------------|------------|---------------|-------------------------------------------------------------------------------------|
| 1  | Meridian Rd/Stapleton Dr           | NBL      | 231                  | 160        | 235               | 200        | 160          | 595        | 900           |                                                                                     |
|    |                                    | NBR      | 386                  | 178        | 235               | 200        | 178          | 615        | 900           |                                                                                     |
|    |                                    | SBL      | 110                  | 68         | 235               | 200        | 68           | 505        | 585           |                                                                                     |
|    |                                    | SBR      | 9                    | 3          | 235               | 200        | 3            | 440        | 585           |                                                                                     |
|    |                                    | EBL      | 15                   | 13         | 235               | 200        | 13           | 450        | 285           | 165-ft Extension with new timing plan                                               |
|    |                                    | EBR      | 252                  | 110        | 235               | 200        | 110          | 545        | 285           | 260-ft Extension with new timing plan                                               |
|    |                                    | WBL      | 350                  | 1070       | 235               | 200        | 1070         | 1505       | 435           | The new signal timing reduced the queue to 238-ft. Double left-turn is recommended. |
|    |                                    | WBR      | 155                  | 111        | 235               | 200        | 111          | 545        | Continuous    |                                                                                     |
| 2  | Meridian Rd/Londonderry Dr         | NBL      | 124                  | 110        | 235               | 200        | 110          | 545        | 800           |                                                                                     |
|    |                                    | NBR      | 370                  | 82         | 235               | 200        | 82           | 515        | Continuous    |                                                                                     |
|    |                                    | SBL      | 110                  | 72         | 235               | 200        | 72           | 505        | 685           |                                                                                     |
|    |                                    | SBR      | 58                   | 21         | 235               | 200        | 21           | 455        | 685           |                                                                                     |
|    |                                    | EBL      | 102                  | 128        | 155               | 160        | 128          | 445        | 285           | 160-ft Extension with new timing plan                                               |
|    |                                    | EBR      | 263                  | 135        | 155               | 160        | 135          | 450        | 285           | 165-ft Extension                                                                    |
|    |                                    | WBL      | 313                  | 987        | 155               | 160        | 987          | 1300       | 360           | A new Signal Timing plan and double left-turn is recommended.                       |
|    |                                    | WBR      | 169                  | 84         | 155               | 160        | 84           | 400        | 275           | 125-ft Extension                                                                    |
| 3  | Londonderry Drive/Liberty Grove Dr | NBL      | 7                    | 5          | Not Required      |            |              | -          |               |                                                                                     |
|    |                                    | NBR      | 6                    | 2          | Not Required      |            |              | -          |               |                                                                                     |
|    |                                    | EBR      | 15                   | 0          | Not Required      |            |              | -          |               |                                                                                     |
|    |                                    | WBL      | 6                    | 1          | Not Required      |            |              | -          | Median        |                                                                                     |
| 4  | Stapleton Dr/Liberty Grove Dr      | SBL      | 35                   | 4          | 115               | 120        | 50           | 285        |               | A 250-foot turn lane is recommended. The taper should be shortened to 85-ft         |
|    |                                    | SBR      | 17                   | 3          | Not Required      |            |              | 0          |               |                                                                                     |
|    |                                    | EBL      | 1                    | 0          | Not Required      |            |              | 0          |               |                                                                                     |
|    |                                    | WBR      | 57                   | 0          | 235               | 200        |              | 435        | 285           | A 150-ft extension                                                                  |

Design speed is based on the EPC ECM criteria.

The summary of improvement are as follows:

#### Meridian Road/Stapleton Drive (#1)

- A new signal timing.
- A 165-ft extension of eastbound left-turn.
- A 260-ft extension of eastbound right-turn.
- Double westbound left-turn

The intersection operations with the new signal timing are included in Appendix B – Existing Conditions labeled *Mitigated*.

**Meridian Road/Londonderry Drive (#2)**

- A new signal timing plan.
- A 160-ft extension of eastbound left-turn.
- A 165-ft extension of eastbound right-turn.
- Double westbound left-turn.
- A 125-ft extension of westbound right-turn.

The intersection operations with the new signal timing are included in Appendix B – Existing Conditions labeled *Mitigated*. This intersection is expected to operate at LOS B with the new signal timing.

**Liberty Grove Drive/Stapleton Drive (#4)**

- A 285-ft southbound left-turn lane is warranted. However, since the 95-percentile queue is only 4-ft, Matrix recommends a 250-ft southbound left-turn lane from the future site driveway at Waterbury Drive to Stapleton Drive.
- A 150-ft extension of westbound right-turn

For the future conditions analysis, it was assumed that the required improvements in the existing conditions have been addressed.

## Projected Development Traffic

This section documents how much anticipated traffic will be generated by the Falcon Reserve development and how the external site trips will be distributed on the adjacent roadway network.

### Trip Generation

The vehicle trips associated with the Project were calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition*. This methodology consists of choosing an independent variable for the land use for a particular time of day. The independent variable correlates to the variation in trip ends and is related to the land use. The value of the independent variable is either multiplied by a weighted average or used in a regression equation to calculate the trips generated by the land use. The *ITE Trip Generation Manual* provides guidance on when to use the weighted average versus the regression equation. In most cases, the regression equations are recommended when there are adequate study data points.

Table 4 shows the trips that are expected to be generated by Falcon Reserve at buildout. It was assumed that 100 percent of trips are made by personal vehicles since there is not a transit route in the vicinity of the project.

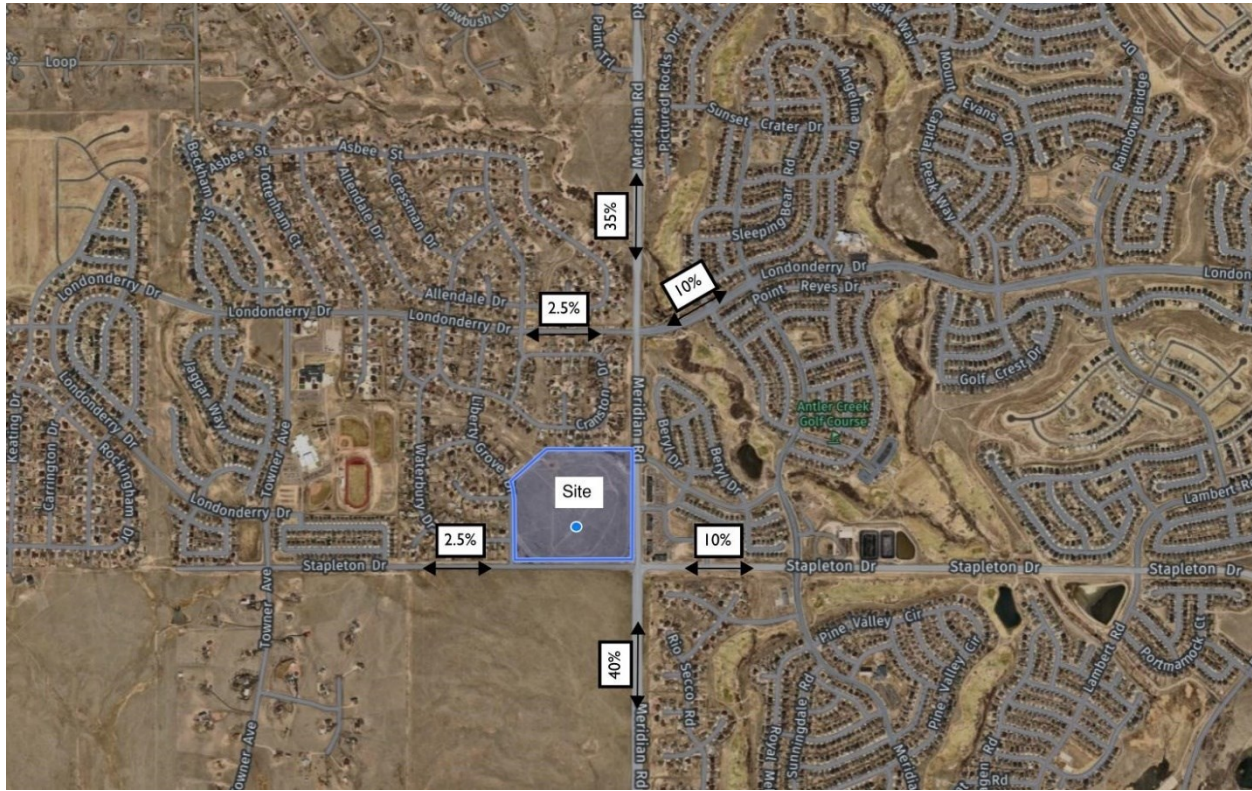
**Table 4. Falcon Reserve Trip Generation**

| ITE Land Use and Code                | Size | Units | Falcon Reserve |          |         |              |          |         |              |          |         |
|--------------------------------------|------|-------|----------------|----------|---------|--------------|----------|---------|--------------|----------|---------|
|                                      |      |       | Weekday        |          |         | AM Peak Hour |          |         | PM Peak Hour |          |         |
|                                      |      |       | Total          | Entering | Exiting | Total        | Entering | Exiting | Total        | Entering | Exiting |
| 210 - Single-Family Detached Housing | 160  | DU    | 1,554          | 777      | 777     | 115          | 30       | 85      | 154          | 97       | 57      |

## Trip Distribution

Figure 7 shows the expected external distribution of travel for the site-generated trips. This distribution was determined by reviewing the existing traffic counts and road classifications in the buildout year provided by El Paso County. For the long term trip distribution see Figure 23.

**Figure 7. Short-Term Trip Distribution**

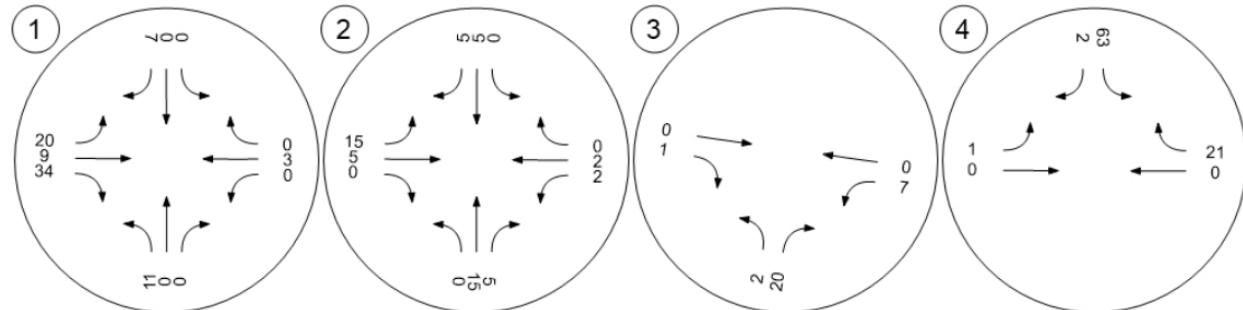


The short term site trips for the AM and PM peak hours are shown in Figure 8 and Figure 9, respectively. The daily site trips are shown in Figure 10.

Figure 8. Falcon Reserve Project Trips Short Term (AM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

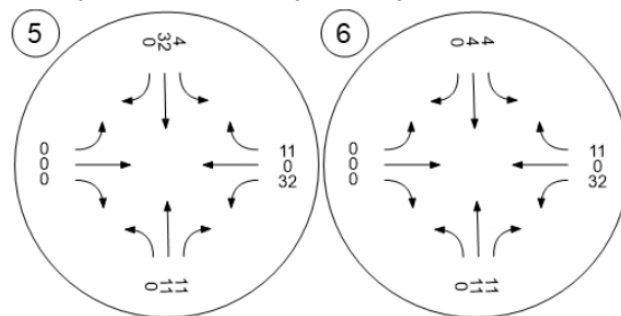
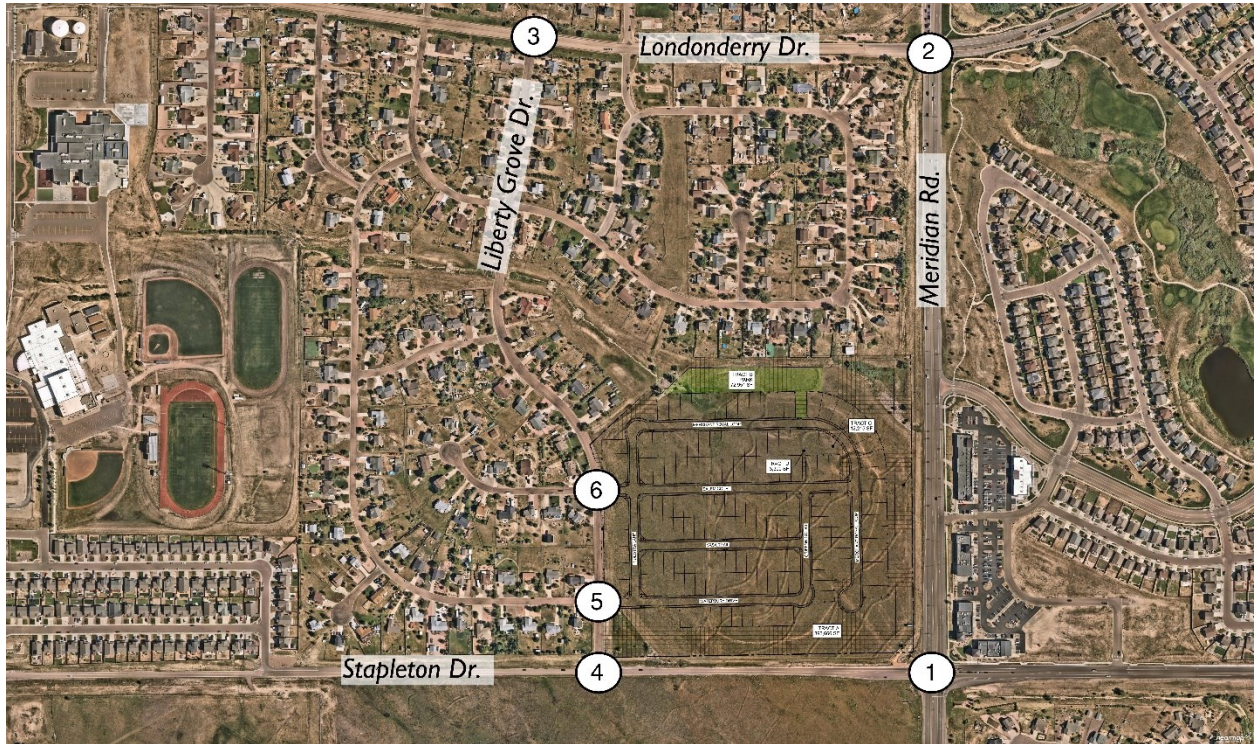
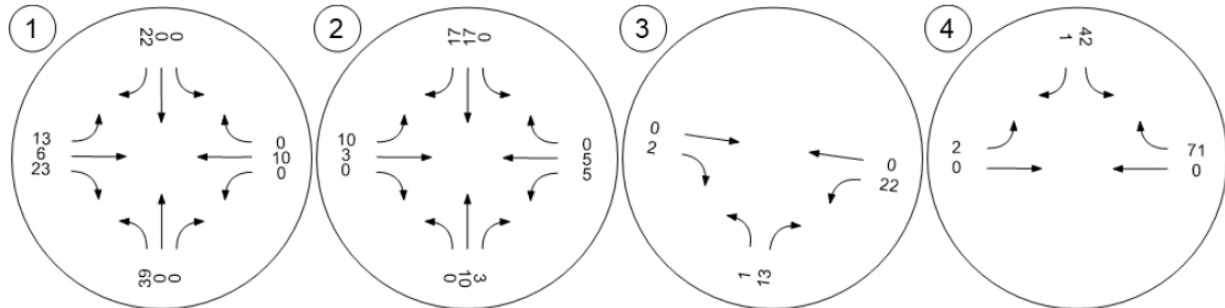


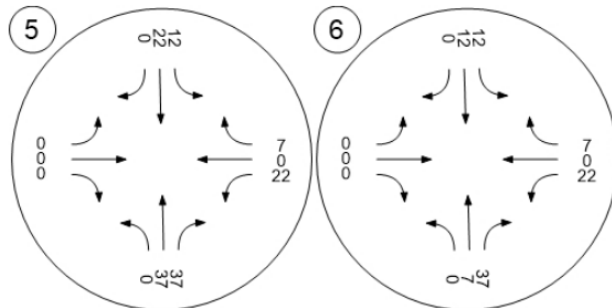
Figure 9. Falcon Reserve Project Trips Short Term (PM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct



**Figure 10. Falcon Reserve Daily Trips (Short Term)**

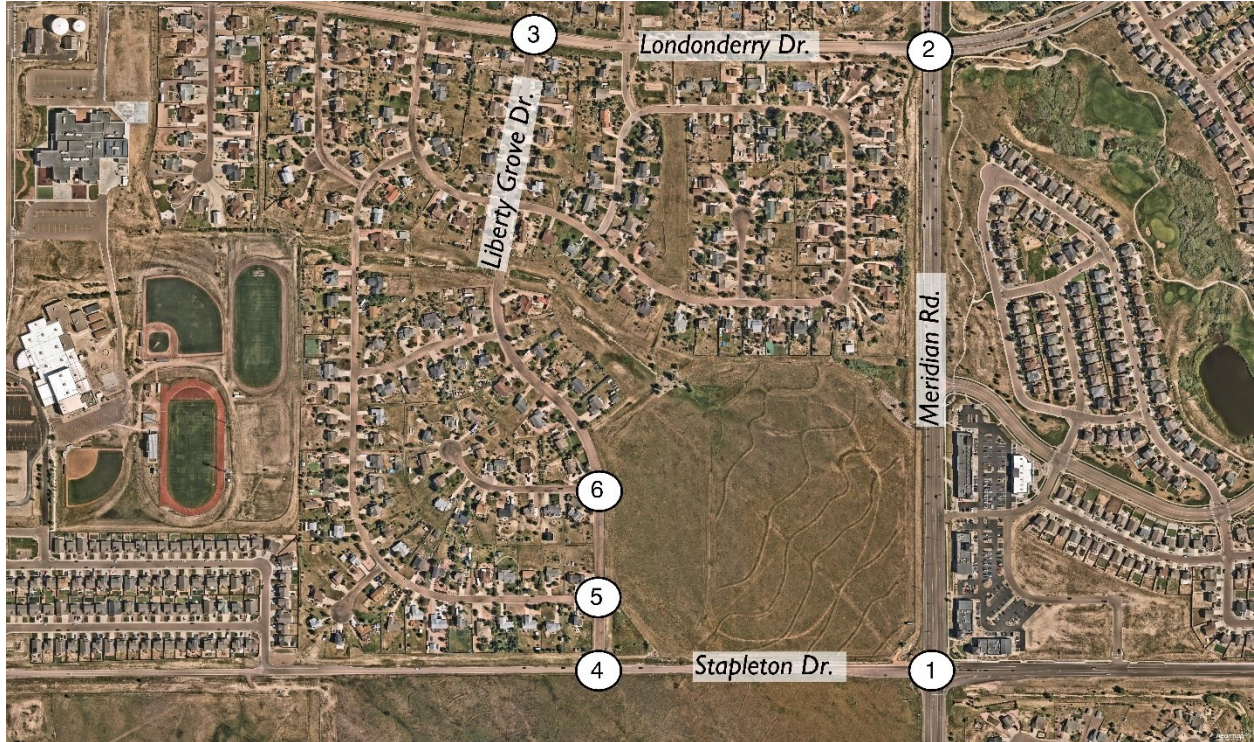
## Traffic Analysis

Traffic conditions both with and without the project were analyzed for buildout year (2028) and horizon year (2045) conditions.

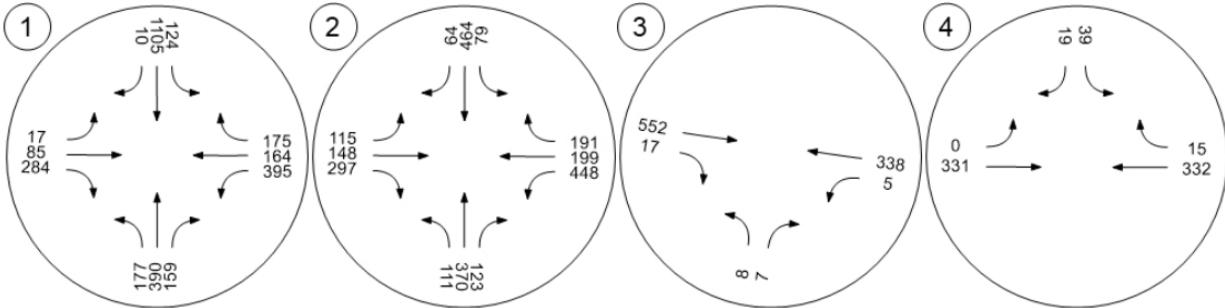
### Buildout (2028) No Project Conditions

The buildout year traffic volumes without the project are shown in Figure 11 and Figure 12 and daily traffic volumes are shown in Figure 13. Matrix reviewed the collected counts on the CDOT Transportation Count Database System (TCDS) website at Station ID 108084, located on Meridian Road north of Woodmen Road. The earliest available count, from 2006, reported an ADT of 13,899. The most recent count, from 2023, recorded an ADT of 23,603 at the same location. As a result, an annual growth rate of 3.06% was applied to the collected counts, and growth factors for the buildout year (2028) and the horizon year (2045) were calculated as 1.128 and 1.885, respectively.

**Figure 11. Buildout (2028) No Project Traffic Volumes (AM Peak Hour)**



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

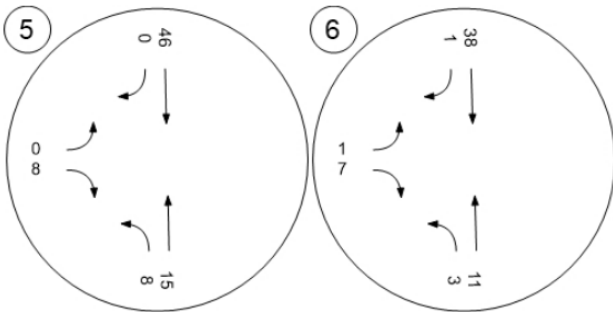
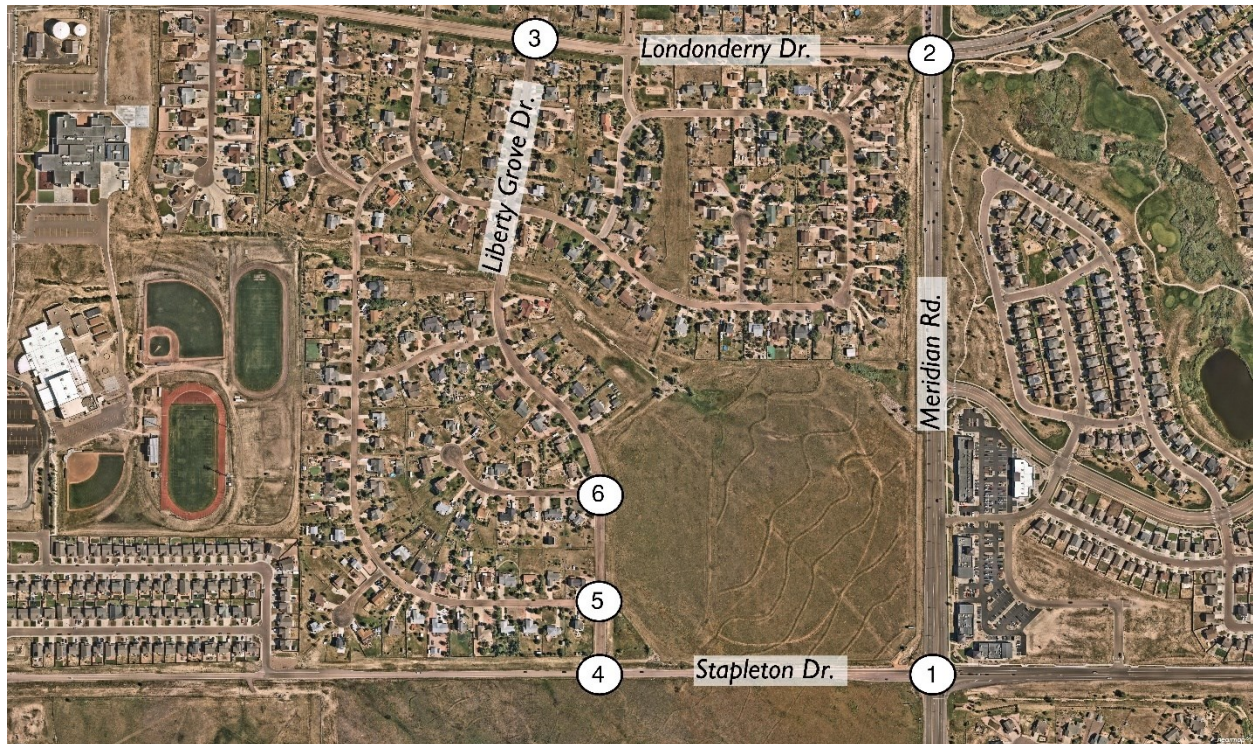
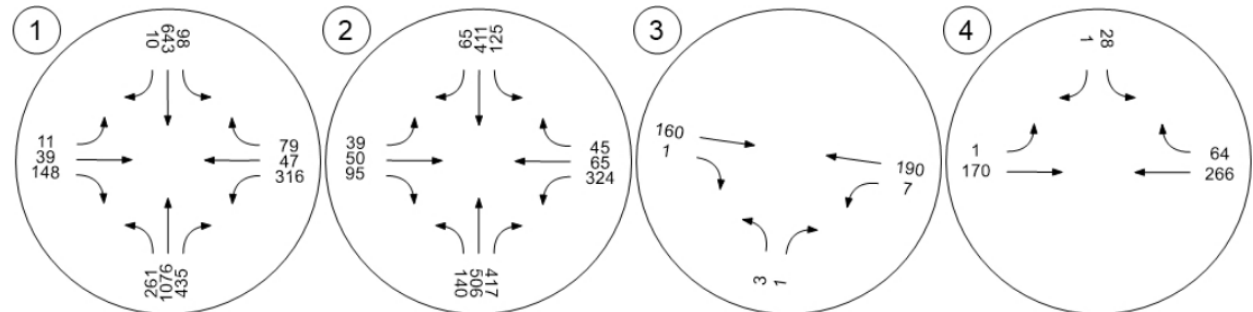


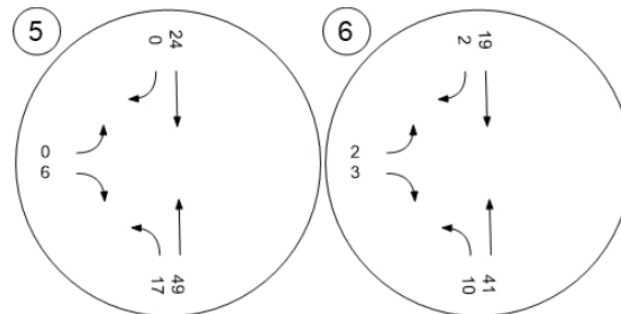
Figure 12. Buildout (2028) No Project Traffic Volumes (PM Peak Hour)



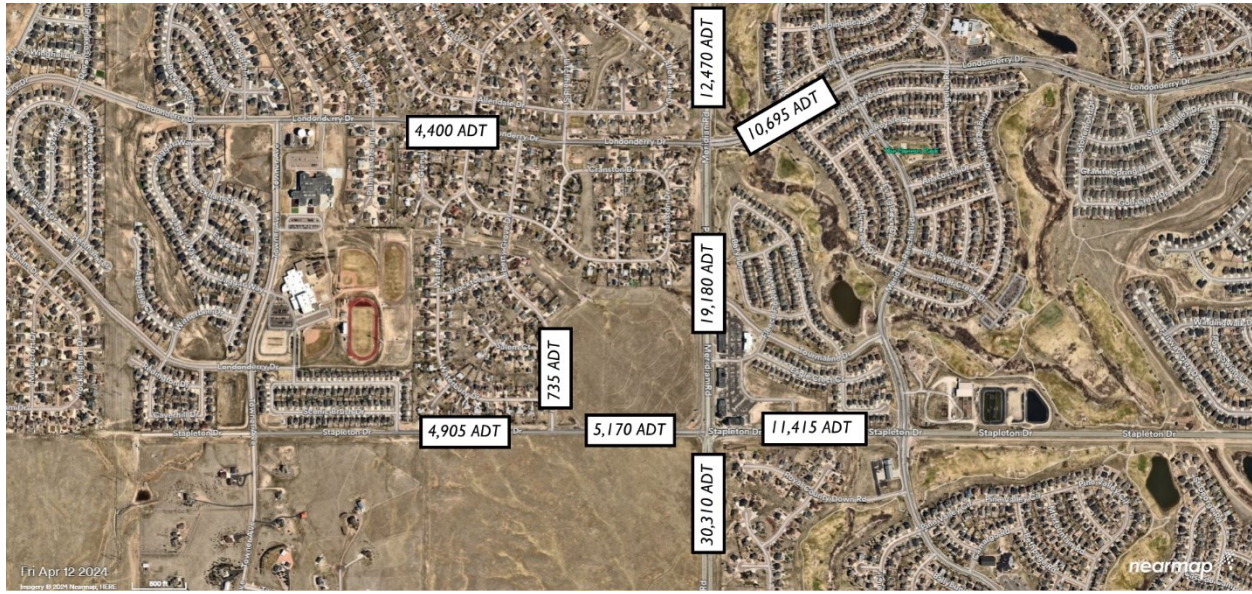
Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

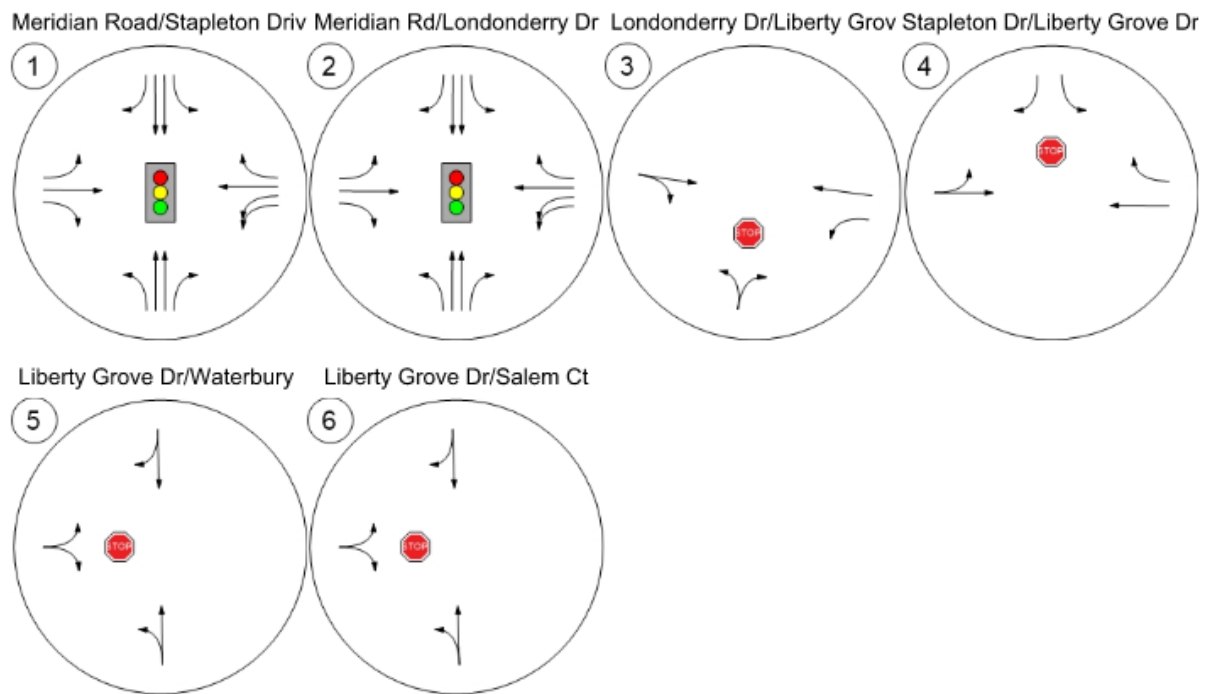
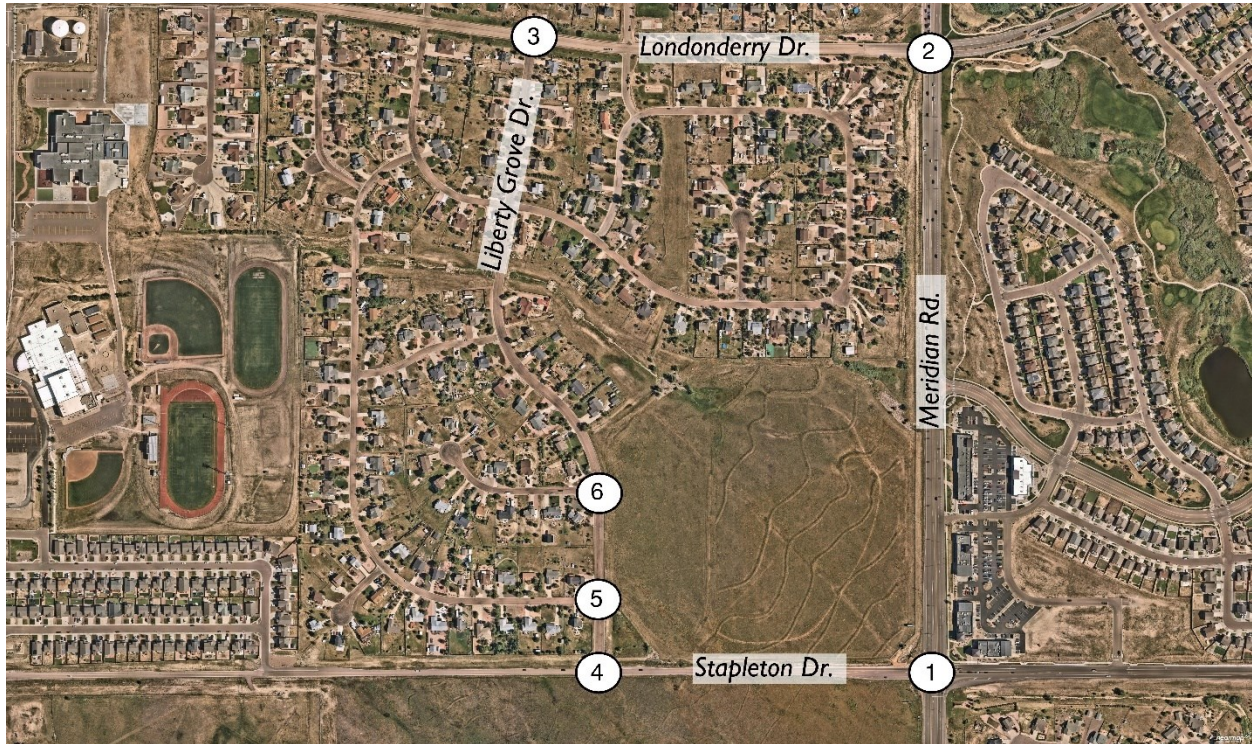


**Figure 13. Buildout (2028) No Project Daily Traffic**



The assumed intersection configurations are shown in Figure 14. The operations of the study area intersections in the buildout no project scenario are shown in Table 5 and Table 6. The turn lane evaluations for the buildout no project are shown in Table 7.

**Figure 14. Buildout (2028) No Project Intersection Configurations**



**Table 5. Buildout (2028) No Project Intersection Operations (AM Peak Hour)**

| Intersection Analysis Summary |                                 |              |                 |            |       |               |     |
|-------------------------------|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| ID                            | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
| 1                             | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Right   | 0.671 | 33.3          | C   |
| 2                             | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.489 | 27.9          | C   |
| 3                             | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.037 | 20.4          | C   |
| 4                             | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | SB Left    | 0.126 | 16.3          | C   |
| 5                             | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Right   | 0.009 | 8.6           | A   |
| 6                             | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.001 | 8.9           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Table 6. Buildout (2028) No Project Intersection Operations (PM Peak Hour)**

| Intersection Analysis Summary |                                 |              |                 |            |       |               |     |
|-------------------------------|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| ID                            | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
| 1                             | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Right   | 0.546 | 25.3          | C   |
| 2                             | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.462 | 23.0          | C   |
| 3                             | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.007 | 11.3          | B   |
| 4                             | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | SB Left    | 0.064 | 12.4          | B   |
| 5                             | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Right   | 0.007 | 8.5           | A   |
| 6                             | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.002 | 9.0           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

All study area intersections are projected to operate at an acceptable LOS at buildout without the project traffic as shown in Table 5 and Table 6.

**Table 7. Buildout (2028) Background Turn Lane Evaluations**

| ID | Intersection                       | Movement | Turning Volume (vph) | Queue (ft) | Deceleration (ft) | Taper (ft) | Storage (ft) | Total (ft) | Notes                                                                                                                              |
|----|------------------------------------|----------|----------------------|------------|-------------------|------------|--------------|------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Meridian Rd/Stapleton Dr           | NBL      | 261                  | 162        | 235               | 200        | 162          | 595        |                                                                                                                                    |
|    |                                    | NBR      | 435                  | 164        | 235               | 200        | 164          | 600        |                                                                                                                                    |
|    |                                    | SBL      | 124                  | 71         | 235               | 200        | 71           | 505        |                                                                                                                                    |
|    |                                    | SBR      | 10                   | 4          | 235               | 200        | 4            | 440        |                                                                                                                                    |
|    |                                    | EBL      | 17                   | 14         | 235               | 200        | 14           | 450        |                                                                                                                                    |
|    |                                    | EBR      | 284                  | 191        | 235               | 200        | 191          | 625        | An additional 80-foot extension will be required, if the required improvement in the existing condition has already been addressed |
|    |                                    | WBL      | 395                  | 244        | 235               | 400        | 244          | 880        | Double Left-Turn                                                                                                                   |
|    |                                    | WBR      | 175                  | 85         | 235               | 200        | 85           | 520        |                                                                                                                                    |
| 2  | Meridian Rd/Londonderry Dr         | NBL      | 140                  | 146        | 235               | 200        | 146          | 580        |                                                                                                                                    |
|    |                                    | NBR      | 417                  | 88         | 235               | 200        | 88           | 525        |                                                                                                                                    |
|    |                                    | SBL      | 125                  | 134        | 235               | 200        | 134          | 570        |                                                                                                                                    |
|    |                                    | SBR      | 65                   | 20         | 235               | 200        | 20           | 455        |                                                                                                                                    |
|    |                                    | EBL      | 115                  | 80         | 155               | 160        | 80           | 395        |                                                                                                                                    |
|    |                                    | EBR      | 297                  | 163        | 155               | 160        | 163          | 480        | Additional 30-foot extension will be required, if the required improvement in the existing condition has already been addressed    |
|    |                                    | WBL      | 448                  | 232        | 155               | 320        | 232          | 705        | Double Left-Turn                                                                                                                   |
|    |                                    | WBR      | 191                  | 80         | 155               | 160        | 80           | 395        |                                                                                                                                    |
| 3  | Londonderry Drive/Liberty Grove Dr | NBL      | 8                    | 5          | Not Required      |            |              | -          |                                                                                                                                    |
|    |                                    | NBR      | 7                    | 2          | Not Required      |            |              | -          |                                                                                                                                    |
|    |                                    | EBR      | 17                   | 0          | Not Required      |            |              | -          |                                                                                                                                    |
|    |                                    | WBL      | 7                    | 1          | Not Required      |            |              | -          |                                                                                                                                    |
| 4  | Stapleton Dr/Liberty Grove Dr      | SBL      | 39                   | 5          | 115               | 120        | 50           | 285        |                                                                                                                                    |
|    |                                    | SBR      | 19                   | 3          | Not Required      |            |              | 0          |                                                                                                                                    |
|    |                                    | EBL      | 1                    | 0          | Not Required      |            |              | 0          |                                                                                                                                    |
|    |                                    | WBR      | 64                   | 0          | 235               | 200        |              | 435        | A 150-ft extension                                                                                                                 |

Design speed is based on the EPC ECM criteria. Total turn lane is rounded to the nearest 5-ft.

### Meridian Road/Stapleton Drive (#1)

- An 80-ft extension of eastbound right-turn with respect to the existing scenario.
- Double westbound left-turn. Included a 400-ft taper, 235-ft deceleration lane, and two 245-ft storage (880 -ft in total).

### Meridian Road/Londonderry Drive (#2)

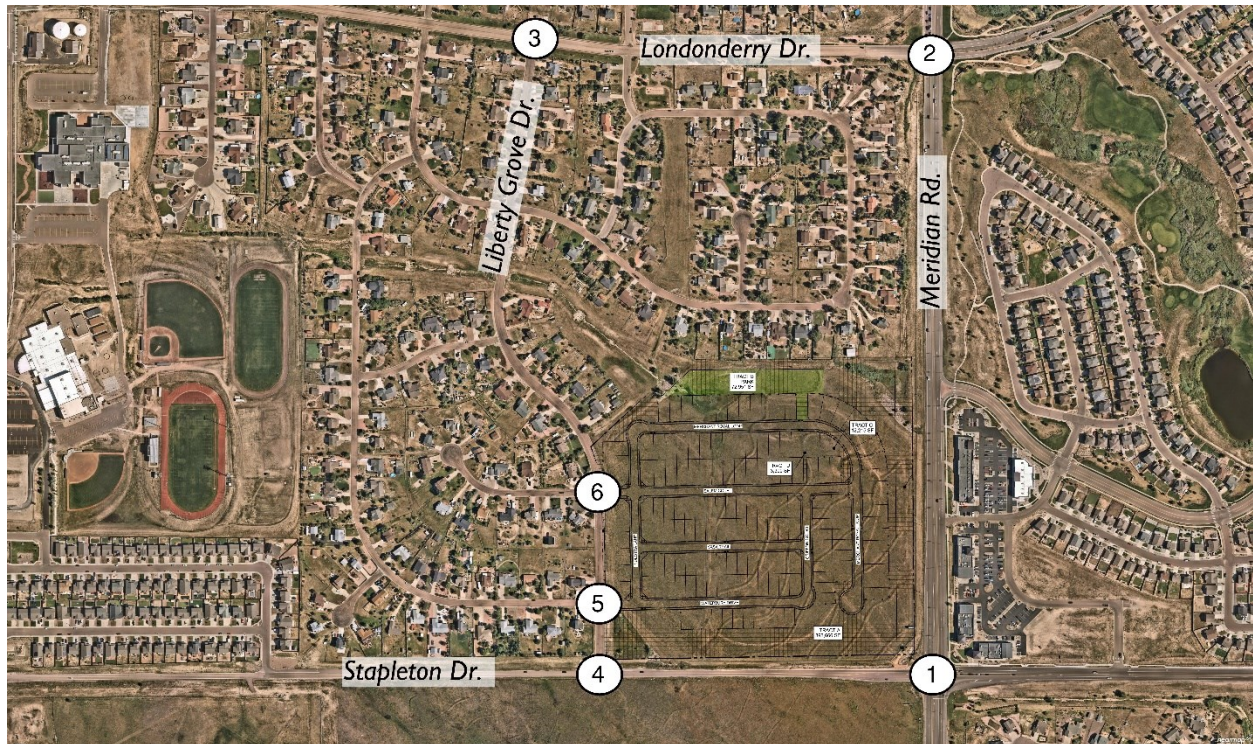
- A 30-ft extension of eastbound right-turn with respect to the existing scenario.
- Double westbound left-turn. Included a 320-ft taper, 155-ft deceleration lane, and two 232-ft storage (705-ft in total).

### Liberty Grove Drive/Stapleton Drive (#4)

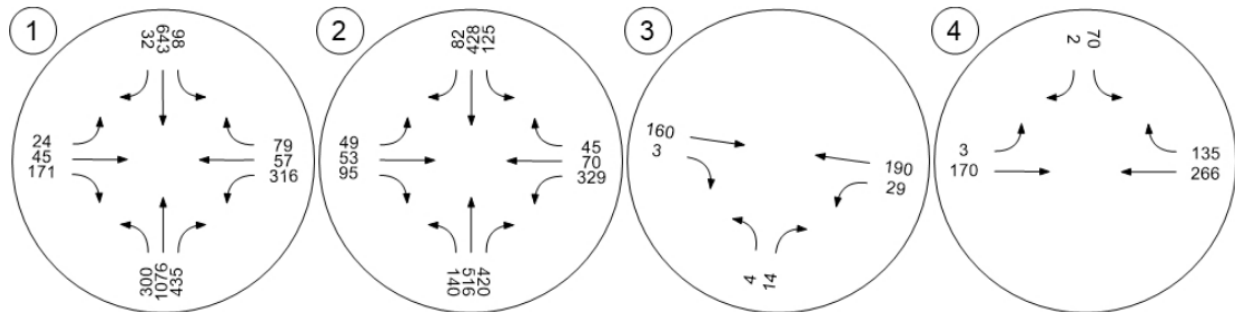
- A 150-ft extension of westbound right-turn lane.



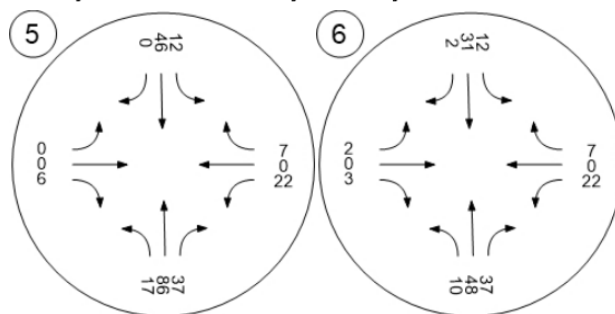
Figure 16. Buildout (2028) With Project Traffic Volumes (PM Peak Hour)



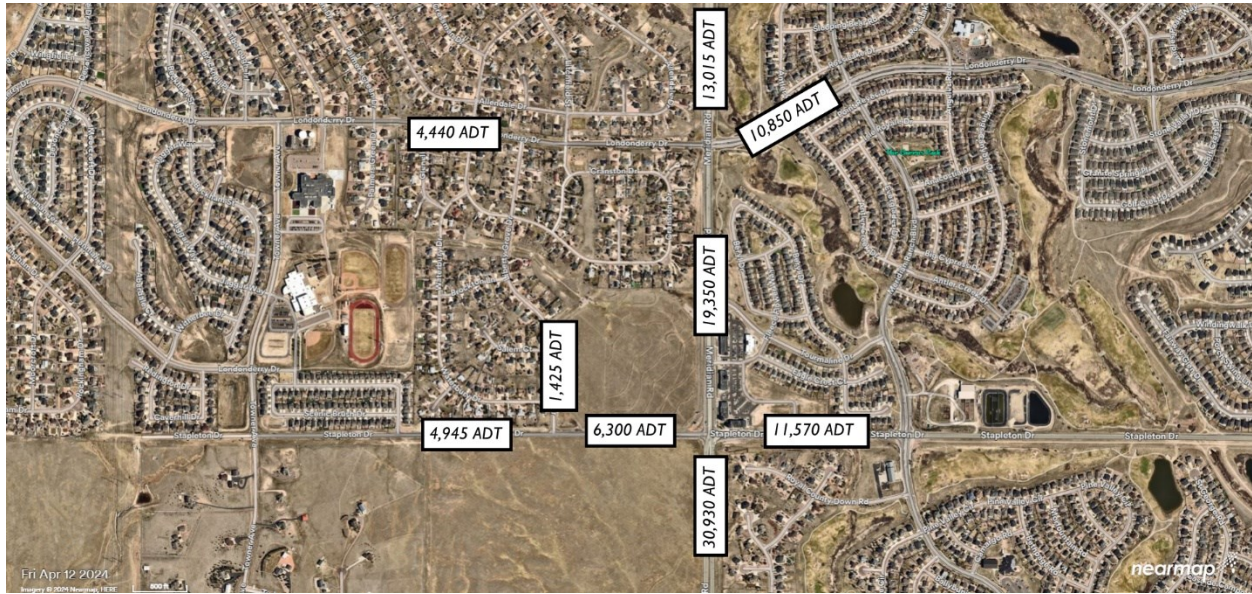
Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr

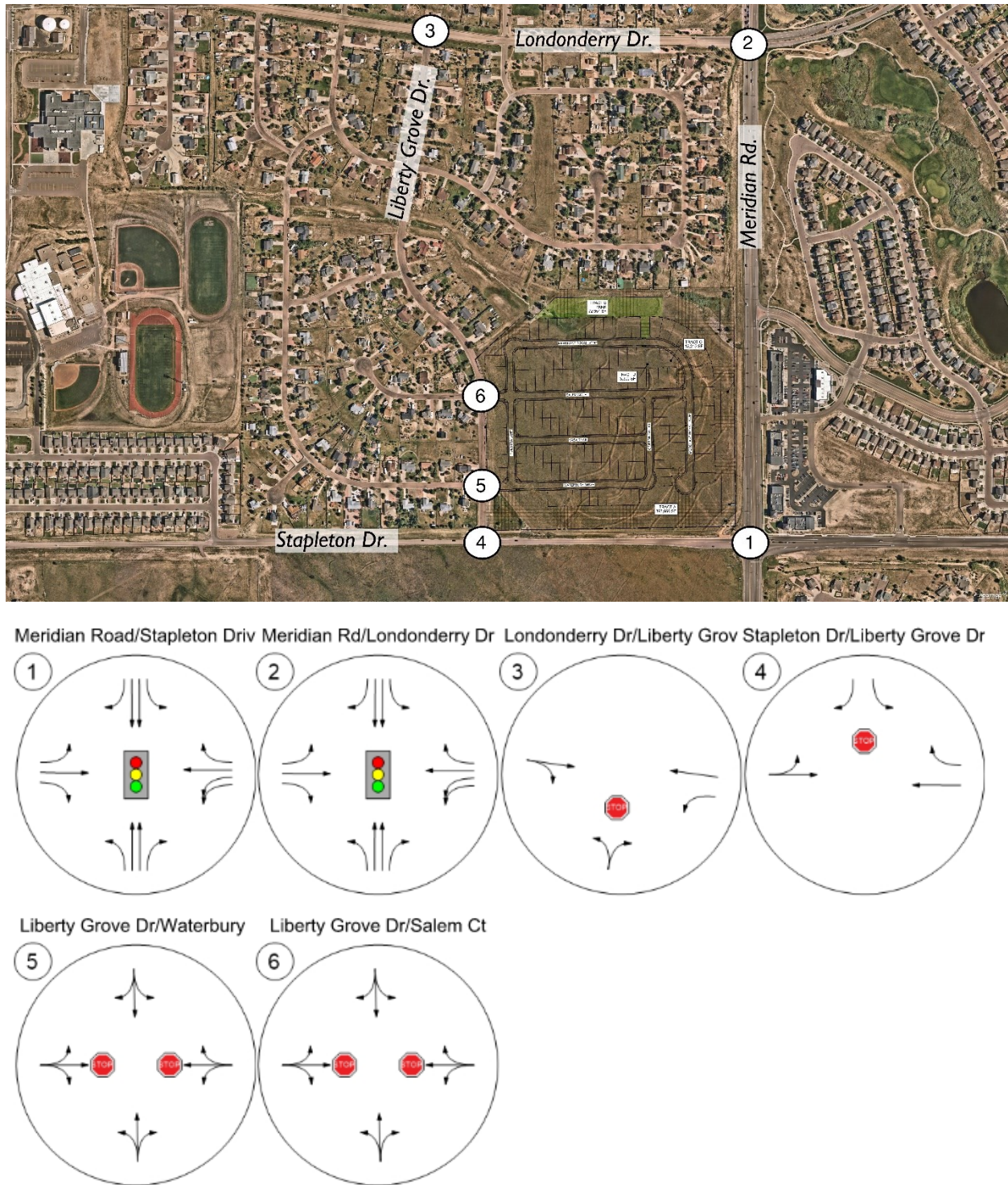


Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct



**Figure 17. Buildout (2028) With Project Daily Traffic Volumes**



**Figure 18. Buildout (2028) With Project Intersection Configurations**

Analysis of the intersections and roadways for buildout conditions with the volumes and configurations shown above results in the operations shown in Table 8 and Table 9.

**Table 8. Buildout (2028) With Project Intersection Operations (AM Peak Hour)**

| Intersection Analysis Summary |                                 |              |                 |            |       |               |     |
|-------------------------------|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| ID                            | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
| 1                             | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | NB Left    | 0.756 | 24.0          | C   |
| 2                             | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.491 | 26.9          | C   |
| 3                             | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.051 | 21.6          | C   |
| 4                             | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | SB Left    | 0.331 | 19.8          | C   |
| 5                             | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | WB Left    | 0.048 | 9.8           | A   |
| 6                             | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | WB Left    | 0.044 | 9.4           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Table 9. Buildout (2028) With Project Intersection Operations (PM Peak Hour)**

| Intersection Analysis Summary |                                 |              |                 |            |       |               |     |
|-------------------------------|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| ID                            | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
| 1                             | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Right   | 0.660 | 17.9          | B   |
| 2                             | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.467 | 23.2          | C   |
| 3                             | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.009 | 11.9          | B   |
| 4                             | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | SB Left    | 0.160 | 13.3          | B   |
| 5                             | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | WB Left    | 0.038 | 10.5          | B   |
| 6                             | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | WB Left    | 0.033 | 9.8           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Table 8 and Table 9 indicate that all study area intersections will operate at an acceptable LOS. The turn lane evaluations are summarized in Table 10.

**Table 10. Buildout (2028) With Project Turn Lane Evaluations**

| ID | Intersection                       | Movement | Turning Volume (vph) | Queue (ft) | Deceleration (ft) | Taper (ft) | Storage (ft) | Total (ft) | Notes                                                             |
|----|------------------------------------|----------|----------------------|------------|-------------------|------------|--------------|------------|-------------------------------------------------------------------|
| 1  | Meridian Rd/Stapleton Dr           | NBL      | 300                  | 306        | 235               | 200        | 306          | 740        |                                                                   |
|    |                                    | NBR      | 435                  | 80         | 235               | 200        | 80           | 515        |                                                                   |
|    |                                    | SBL      | 124                  | 110        | 235               | 200        | 110          | 545        |                                                                   |
|    |                                    | SBR      | 32                   | 5          | 235               | 200        | 5            | 440        |                                                                   |
|    |                                    | EBL      | 37                   | 42         | 235               | 200        | 42           | 475        | 25-ft Extension with respect to the Buildout Background scenario. |
|    |                                    | EBR      | 318                  | 195        | 235               | 200        | 195          | 630        | 5-ft Extension with respect to the Buildout Background scenario.  |
|    |                                    | WBL      | 395                  | 181        | 235               | 400        | 181          | 815        |                                                                   |
|    |                                    | WBR      | 175                  | 67         | 235               | 200        | 67           | 500        |                                                                   |
| 2  | Meridian Rd/Londonderry Dr         | NBL      | 140                  | 146        | 235               | 200        | 146          | 580        |                                                                   |
|    |                                    | NBR      | 420                  | 89         | 235               | 200        | 89           | 525        |                                                                   |
|    |                                    | SBL      | 125                  | 136        | 235               | 200        | 136          | 570        |                                                                   |
|    |                                    | SBR      | 82                   | 24         | 235               | 200        | 24           | 460        |                                                                   |
|    |                                    | EBL      | 130                  | 95         | 155               | 160        | 95           | 410        |                                                                   |
|    |                                    | EBR      | 297                  | 164        | 155               | 160        | 164          | 480        |                                                                   |
|    |                                    | WBL      | 450                  | 219        | 155               | 320        | 219          | 695        |                                                                   |
|    |                                    | WBR      | 191                  | 76         | 155               | 160        | 76           | 390        |                                                                   |
| 3  | Londonderry Drive/Liberty Grove Dr | NBL      | 10                   | 10         | Not Required      |            |              |            |                                                                   |
|    |                                    | NBR      | 27                   | 10         | Not Required      |            |              |            |                                                                   |
|    |                                    | EBR      | 18                   | 0          | Not Required      |            |              |            |                                                                   |
|    |                                    | WBL      | 29                   | 2          | 155               | 160        | 50           | 365        | 365-ft Westbound turn lane.                                       |
| 4  | Stapleton Dr/Liberty Grove Dr      | SBL      | 102                  | 35         | 115               | 120        | 100          | 335        | A 250-ft turn lane from the site driveway to Stapleton Drive.     |
|    |                                    | SBR      | 21                   | 3          | Not Required      |            |              |            |                                                                   |
|    |                                    | EBL      | 3                    | 0          | Not Required      |            |              |            |                                                                   |
|    |                                    | WBR      | 135                  | 0          | 235               | 200        |              | 435        |                                                                   |

Design speed is based on the EPC ECM criteria. Total turn lane is rounded to the nearest 5-ft.

Summary of the required improvements for the buildout total are listed as follows:

#### Meridian Road/Stapleton Drive (#1)

- A 25-ft extension of eastbound left-turn with respect to the buildout background scenario.
- A 5-ft extension of eastbound right-turn with respect to the buildout background scenario.

#### Londonderry Drive/Liberty Grove Drive (#3)

- A 365-ft westbound left-turn. Included a 155-ft deceleration lane, a 160-ft taper and 50-ft of storage. Turn lane occurs within the median.

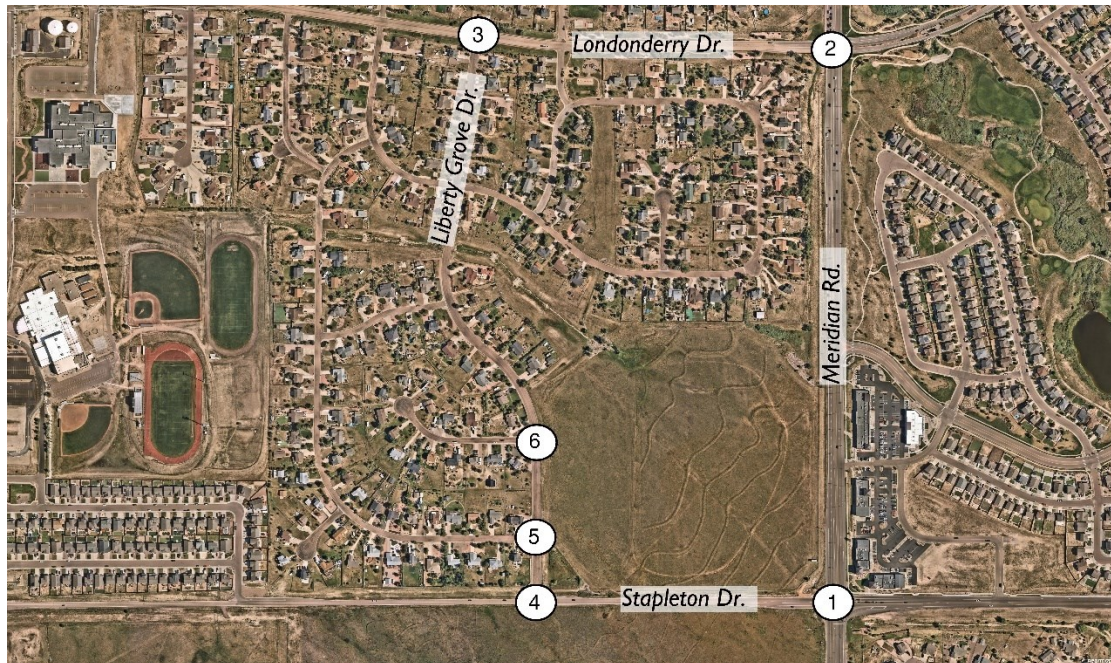
#### Liberty Grove Drive/Stapleton Drive (#4)

- A 250-ft southbound left-turn lane due to limited spacing between Stapleton Drive and Waterbury Drive. The turn lane can fully accommodate the queue.
- A 150-ft extension of westbound right-turn lane.

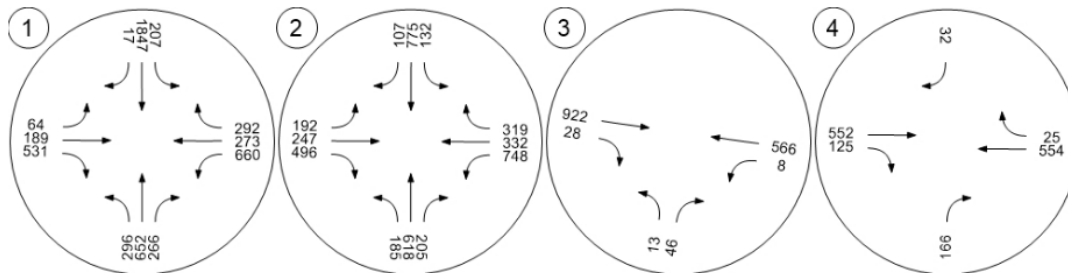
## Horizon (2045) No Project Conditions

The horizon year traffic volumes without the Falcon Reserve project are shown in Figure 19 and Figure 20, and daily traffic volumes are shown in Figure 21. Matrix reviewed the collected counts on the CDOT Transportation Count Database System (TCDS) website at Station ID 108084, located on Meridian Road north of Woodmen Road. The earliest available count, from 2006, reported an ADT of 13,899. The most recent count, from 2023, recorded an ADT of 23,603 at the same location. As a result, an annual growth rate of 3.06% was applied to the collected counts, and growth factors for the buildout year (2028) and the horizon year (2045) were calculated as 1.128 and 1.885, respectively. Additionally, the traffic from a development immediately to the south, namely, the Autumn Acres were added to the model. An excerpt of this study which was prepared by LSC Consultant can be found in Appendix F – Supporting Documents. Although this development has been canceled, a new yet similar land use development is anticipated to eventually take place at this location. Therefore, the traffic generated from this development was not removed from our analysis. Finally, according to the 2023 Briargate Parkway/Stapleton Road Corridor Study, the access point on Stapleton Drive is restricted to Right-In-Right-Out (RIRO) only accesses in the horizon year. It was assumed that Stapleton Drive will be extended to the west connecting with existing Briargate Parkway with its ultimate roadway section (4-lane principal arterial) by the year 2045.

Figure 19. Horizon (2045) No Project Traffic Volumes (AM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

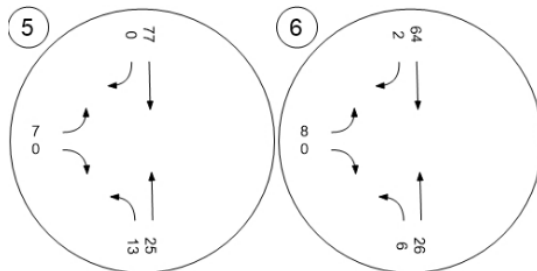
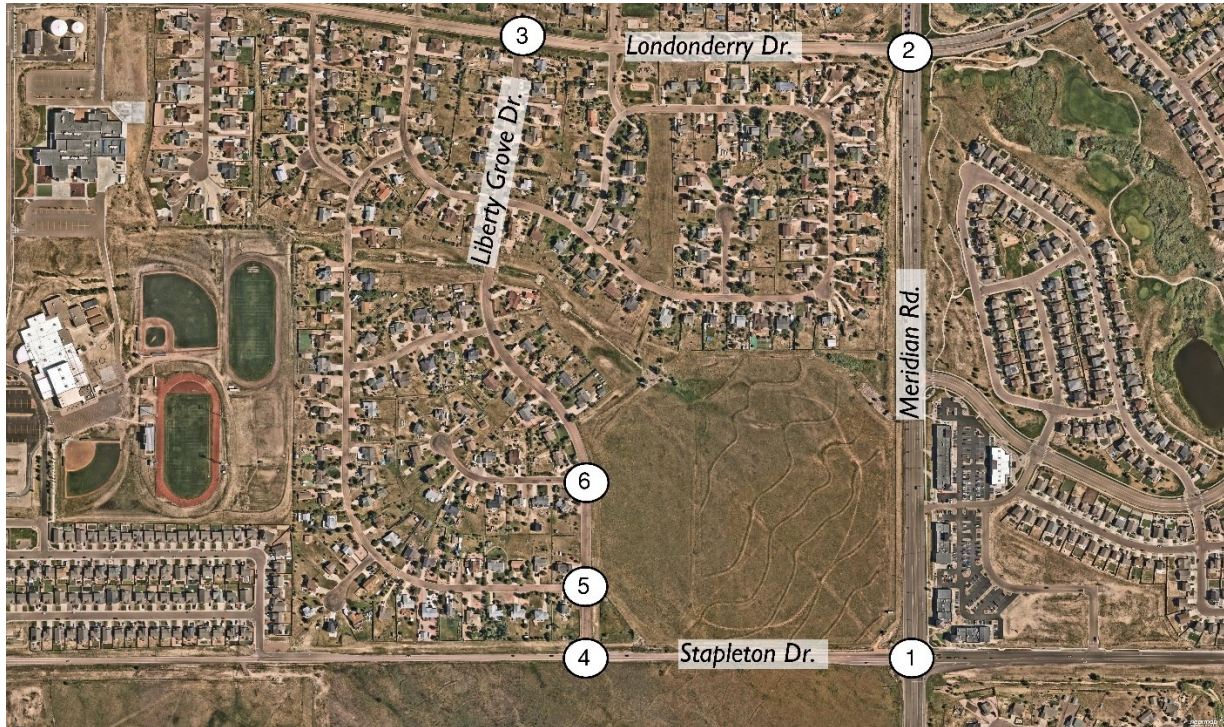
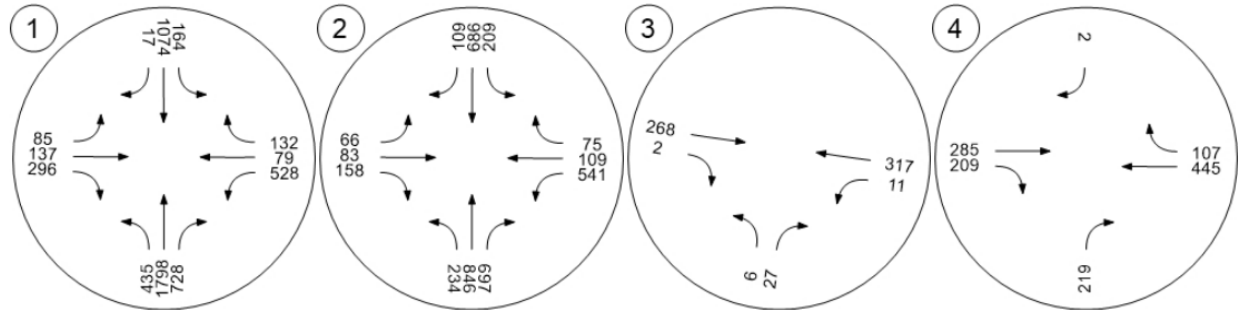


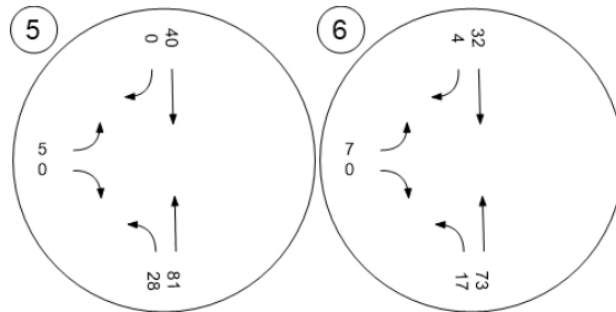
Figure 20. Horizon (2045) No Project Traffic Volumes (PM Peak Hour)



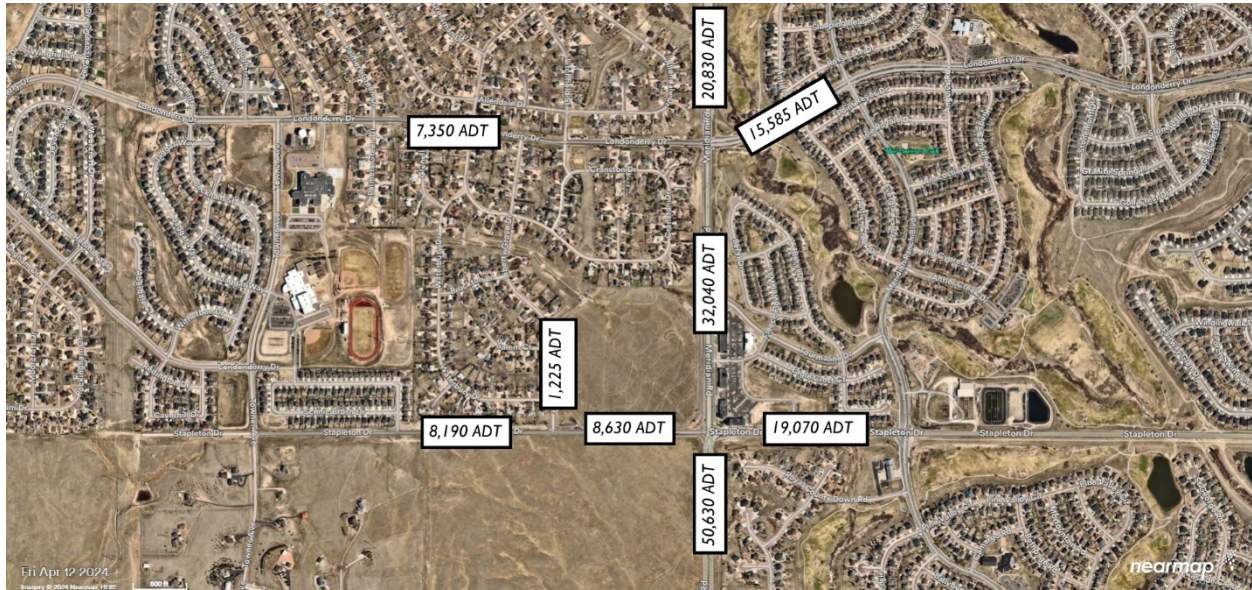
Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct



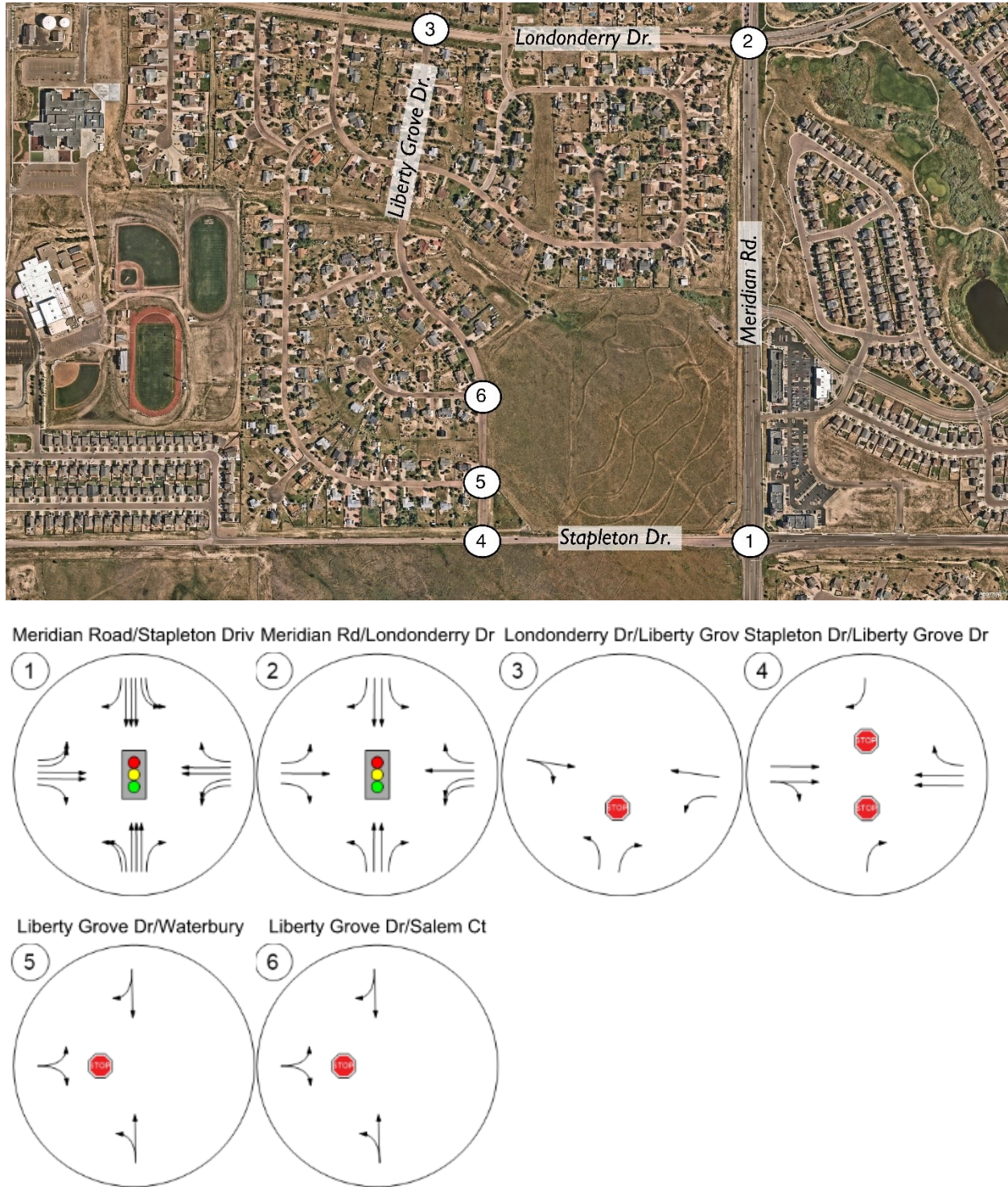
**Figure 21. Horizon (2045) No Project Daily Traffic Volumes**



The current MTCP identifies that Meridian Road south of Stapleton Drive will be a 6-lane urban principle arterial in the 2045 plan, therefore Meridian is modeled to have three through lanes for northbound direction for the horizon year.

The assumed intersection configurations are shown in Figure 22. The operations of the study area intersections in the horizon background (no project) scenario are shown in Table 11 and Table 12.

Figure 22. Horizon (2045) No Project Intersection Configurations



The intersection configurations were derived from the Autumn Acres TIS (2022).

**Table 11. Horizon (2045) No Project Intersection Operations (AM Peak Hour)****Intersection Analysis Summary**

| ID | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Left    | 0.729 | 42.3          | D   |
| 2  | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.730 | 41.0          | D   |
| 3  | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.121 | 40.3          | E   |
| 4  | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | NB Right   | 0.273 | 12.7          | B   |
| 5  | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Left    | 0.008 | 9.3           | A   |
| 6  | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.009 | 9.1           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Table 12. Horizon (2045) No Project Intersection Operations (PM Peak Hour)****Intersection Analysis Summary**

| ID | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Left    | 0.623 | 33.8          | C   |
| 2  | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.558 | 30.9          | C   |
| 3  | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.014 | 13.4          | B   |
| 4  | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | NB Right   | 0.313 | 12.1          | B   |
| 5  | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Left    | 0.006 | 9.6           | A   |
| 6  | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.008 | 9.4           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

As shown in Table 11 and Table 12, all intersections operate at acceptable LOS, except for the intersection of Londonderry Drive/Liberty Grove (#3) that operates at LOS E during the AM peak hour. This is due to the deficient northbound left-turn movement. Since the left-turn volume is low and the queue is no more than 1.1 vehicles, Matrix does not recommend any mitigation in the horizon no project conditions. Turn lane evaluations are summarized in Table 13.

**Table 13. Horizon (2045) No Project Turn Lane Evaluations**

| ID | Intersection                       | Movement | Turning Volume (vph) | Queue (ft) | Deceleration (ft) | Taper (ft) | Storage (ft) | Total (ft) | Notes                                                              |
|----|------------------------------------|----------|----------------------|------------|-------------------|------------|--------------|------------|--------------------------------------------------------------------|
| 1  | Meridian Rd/Stapleton Dr           | NBL      | 435                  | 253        | 235               | 400        | 253          | 890        | Double Left Turn                                                   |
|    |                                    | NBR      | 728                  | -          | 235               | 200        | -            | 435        |                                                                    |
|    |                                    | SBL      | 207                  | 160        | 235               | 400        | 160          | 795        | Double Left Turn                                                   |
|    |                                    | SBR      | 17                   | 7          | 235               | 200        | 7            | 440        |                                                                    |
|    |                                    | EBL      | 85                   | 56         | 235               | 400        | 56           | 690        | Double Left Turn                                                   |
|    |                                    | EBR      | 531                  | -          | 235               | 200        | -            | 435        |                                                                    |
|    |                                    | WBL      | 660                  | 438        | 235               | 400        | 438          | 1075       | 195-ft Extension with respect to the Buildout Background scenario. |
|    |                                    | WBR      | 292                  | -          | 235               | 200        | -            | 435        |                                                                    |
| 2  | Meridian Rd/Londonderry Dr         | NBL      | 234                  | 240        | 235               | 200        | 240          | 675        |                                                                    |
|    |                                    | NBR      | 697                  | 253        | 235               | 200        | 253          | 690        |                                                                    |
|    |                                    | SBL      | 209                  | 114        | 235               | 200        | 114          | 550        |                                                                    |
|    |                                    | SBR      | 109                  | 47         | 235               | 200        | 47           | 480        |                                                                    |
|    |                                    | EBL      | 192                  | 142        | 155               | 160        | 142          | 455        |                                                                    |
|    |                                    | EBR      | 496                  | 284        | 155               | 160        | 284          | 600        | 120-ft Extension with respect to the Buildout Background scenario. |
|    |                                    | WBL      | 748                  | 402        | 155               | 320        | 402          | 875        | 170-ft Extension with respect to the Buildout Background scenario. |
|    |                                    | WBR      | 319                  | 132        | 155               | 160        | 132          | 445        | 45-ft Extension with respect to the Buildout Background scenario.  |
| 3  | Londonderry Drive/Liberty Grove Dr | NBL      | 13                   | 10         | Not Required      |            |              |            |                                                                    |
|    |                                    | NBR      | 46                   | 14         | Not Required      |            |              |            |                                                                    |
|    |                                    | EBR      | 28                   | 0          | Not Required      |            |              |            |                                                                    |
|    |                                    | WBL      | 11                   | 1          | 155               | 160        | 50           | 365        |                                                                    |
| 4  | Stapleton Dr/Liberty Grove Dr      | WBR      | 25                   | 0          | 235               | 200        |              | 435        |                                                                    |

Design speed is based on the EPC ECM criteria.

### Meridian Road/Stapleton Drive (#1)

- Double northbound left-turn. Included a 400-ft taper, 235-ft deceleration lanes, and two 253-ft storage lanes. (890-ft in total)
- Double southbound left-turn. Included a 400-ft taper, 235-ft deceleration lane, and two 167-ft storage (795-ft in total).
- Double eastbound left-turn. Included a 400-ft taper, 235-ft deceleration lane, and two 56-ft storage (690-ft in total).
- A 195-ft extension of westbound left-turn.

### Meridian Road/Londonderry Drive (#2)

- A 120-ft extension of eastbound right-turn with respect to the buildout background scenario.
- A 170-ft extension of westbound left-turn with respect to the buildout background scenario.
- A 45-ft extension of westbound right-turn with respect to the buildout background scenario.

## Horizon (2045) With Project Conditions

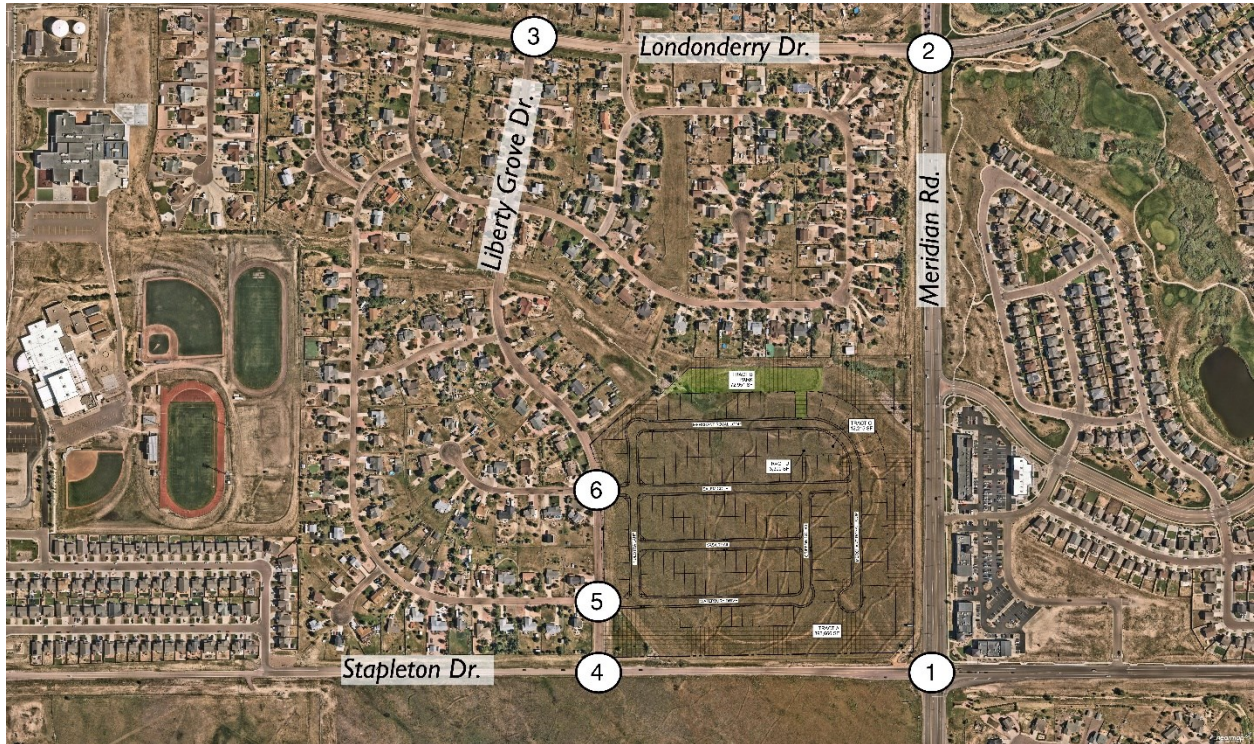
The long-term project's trip distribution for 2045 is shown in Figure 23. The trip distribution for the horizon year was adjusted to reflect the improvements on Stapleton Drive. The long term site trips for both the AM and PM peak hours are shown in Figure 24 and Figure 25. The long term daily trips are shown in Figure 26.

Due to the planned improvements on Stapleton Road, which will restrict the Stapleton Road/Liberty Grove Drive intersection (#4) to right-in/right-out (RIRO) access in the horizon year, site traffic has been reassigned to reflect this change. Also, according to the current MTCP, Meridian Road south of Stapleton Drive will be a 6-lane urban principal arterial in the 2045 plan, and Stapleton Drive will be a 4-lane principal arterial.

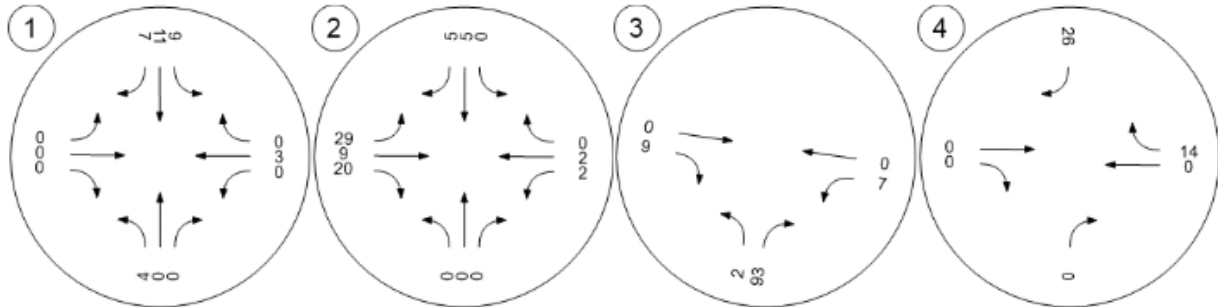
**Figure 23. Long-Term Trip Distribution**



Figure 24. Falcon Reserve Project Trips Long Term (AM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

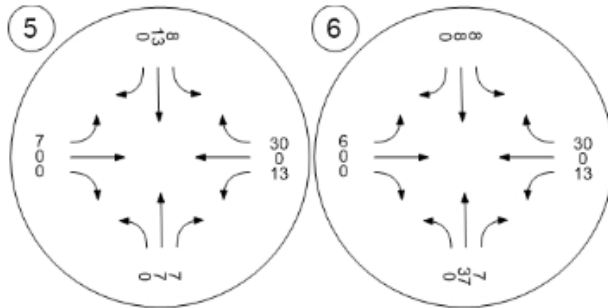
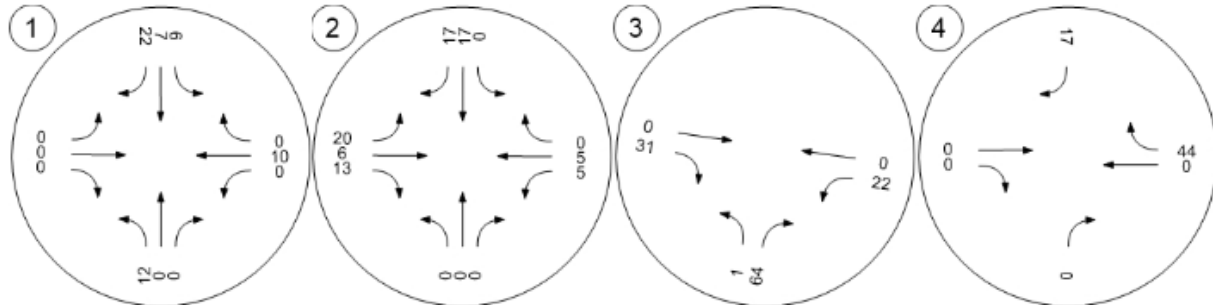


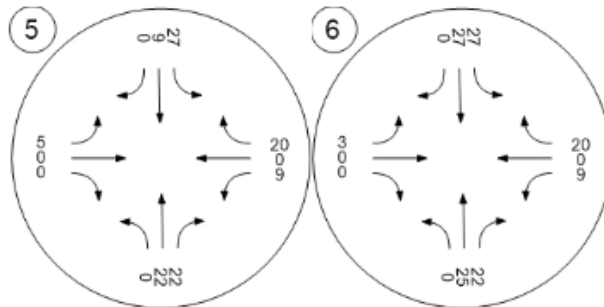
Figure 25. Falcon Reserve Project Trips Long Term (PM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

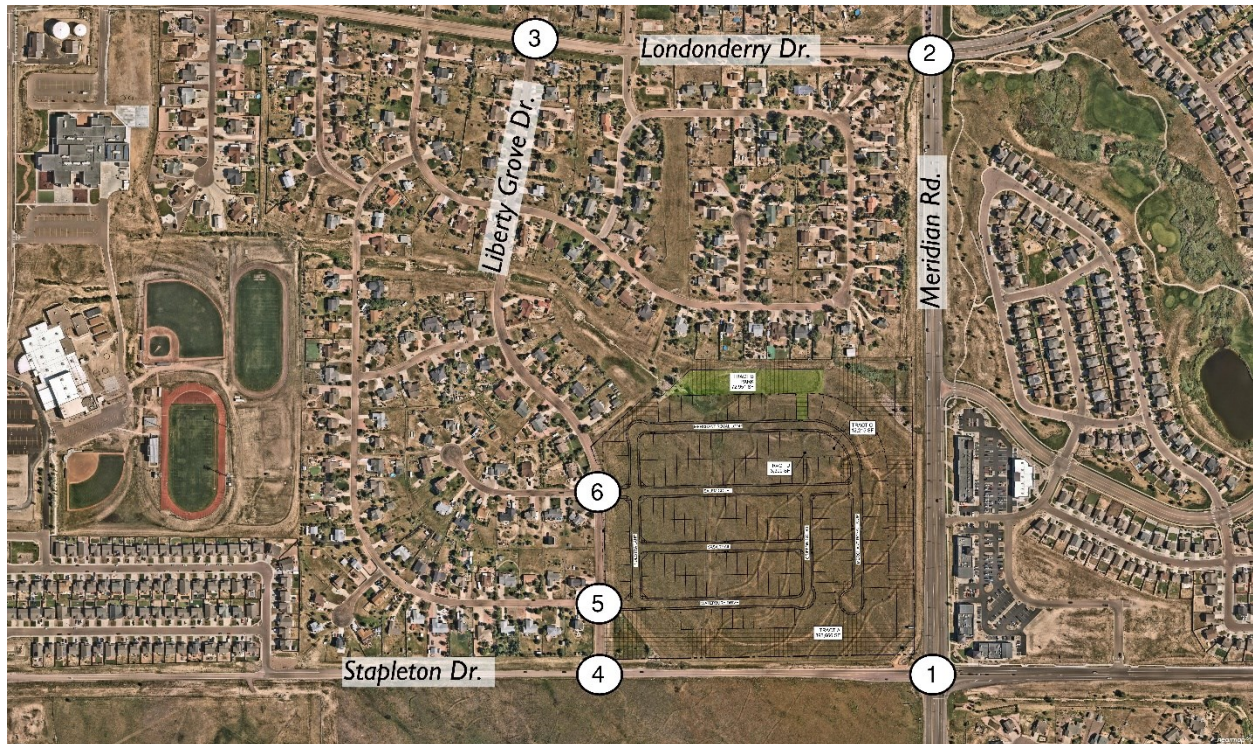


**Figure 26. Falcon Reserve Daily Trips (Long Term)**

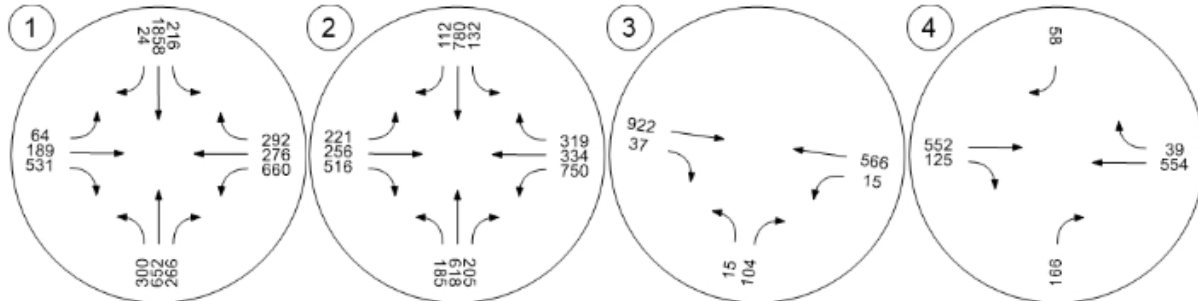


The AM, PM and daily traffic volumes in the horizon year with the addition of the project are as shown in Figure 27, Figure 28, and Figure 29, respectively.

Figure 27. Horizon (2045) With Project Traffic Volumes (AM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

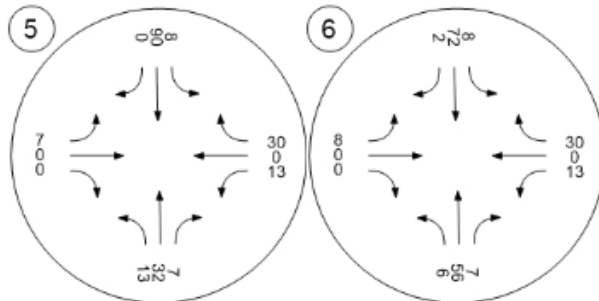
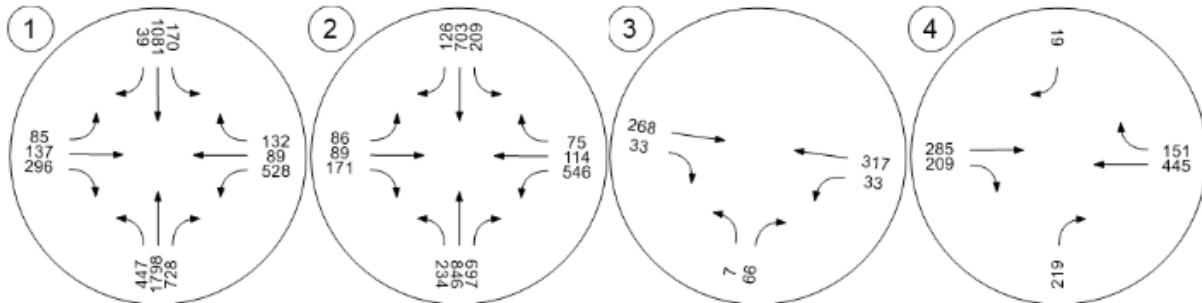


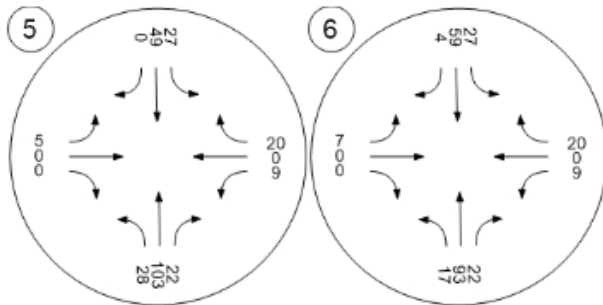
Figure 28. Horizon (2045) With Project Traffic Volumes (PM Peak Hour)



Meridian Road/Stapleton Dr Meridian Rd/Londonderry Dr Londonderry Dr/Liberty Grov Stapleton Dr/Liberty Grove Dr



Liberty Grove Dr/Waterbury Liberty Grove Dr/Salem Ct

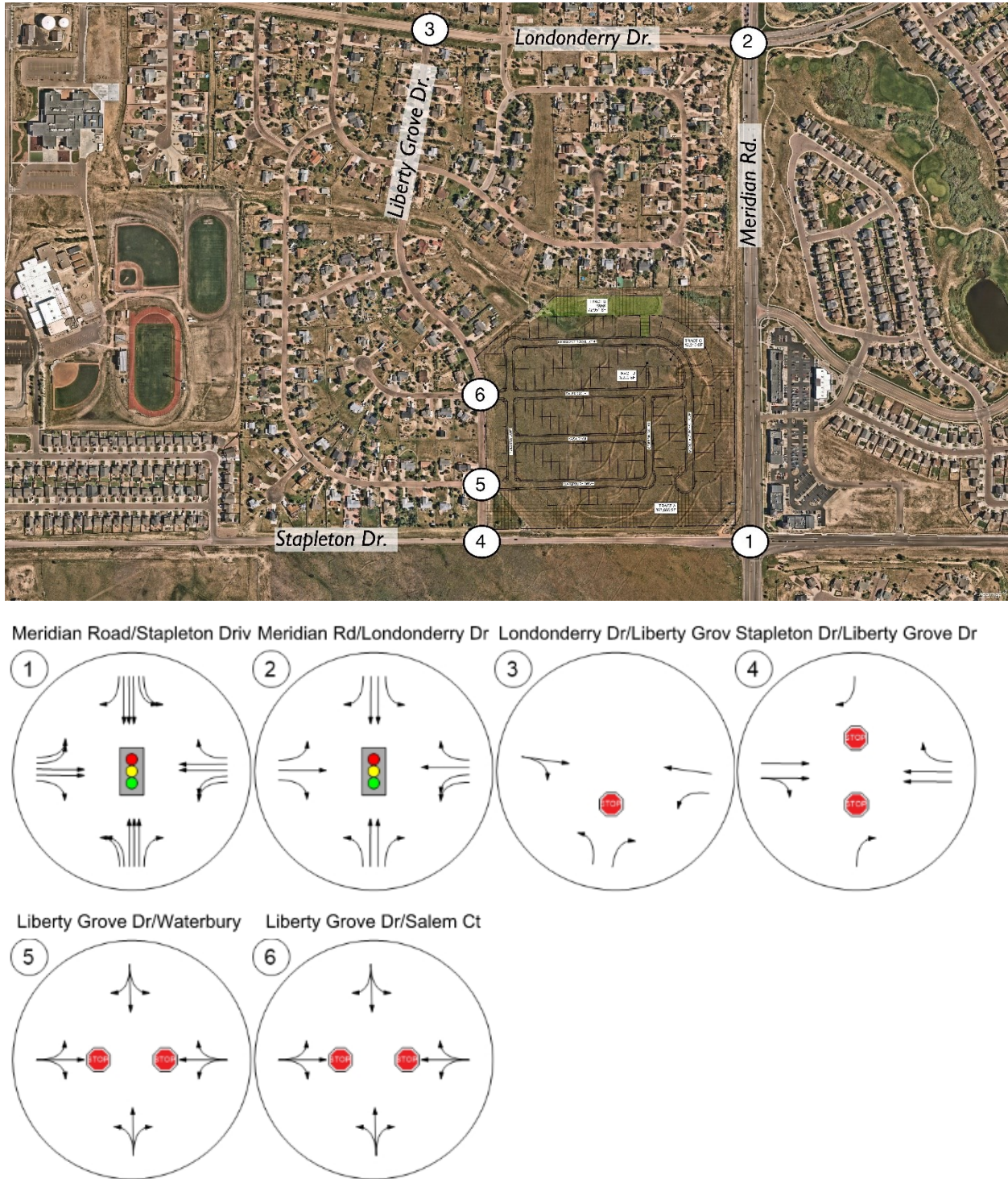


**Figure 29. Horizon (2045) With Project Daily Traffic Volumes**



The turn lane configurations for the horizon scenario with the project are shown in Figure 30. The widening of Stapleton Drive is programmed as a part of the transportation improvement plan (County Road Widening Projects) in the MTCP.

Figure 30. Horizon (2045) With Project Intersection Configurations



Analysis of the intersections and roadways for the horizon conditions with the volumes and configurations shown above results in the operations shown in Table 14 and Table 15.

**Table 14. Horizon (2045) With Project Intersection Operations (AM Peak Hour)****Intersection Analysis Summary**

| ID | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Left    | 0.732 | 42.8          | D   |
| 2  | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.739 | 42.0          | D   |
| 3  | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.144 | 42.8          | E   |
| 4  | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | NB Right   | 0.273 | 12.7          | B   |
| 5  | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Left    | 0.010 | 10.0          | A   |
| 6  | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.011 | 9.9           | A   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Table 15. Horizon (2045) With Project Intersection Operations (PM Peak Hour)****Intersection Analysis Summary**

| ID | Intersection Name               | Control Type | Method          | Worst Mvmt | V/C   | Delay (s/veh) | LOS |
|----|---------------------------------|--------------|-----------------|------------|-------|---------------|-----|
| 1  | Meridian Road/Stapleton Drive   | Signalized   | HCM 7th Edition | EB Left    | 0.625 | 34.0          | C   |
| 2  | Meridian Rd/Londonderry Dr      | Signalized   | HCM 7th Edition | NB Left    | 0.568 | 31.1          | C   |
| 3  | Londonderry Dr/Liberty Grove Dr | Two-way stop | HCM 7th Edition | NB Left    | 0.018 | 14.3          | B   |
| 4  | Stapleton Dr/Liberty Grove Dr   | Two-way stop | HCM 7th Edition | NB Right   | 0.313 | 12.1          | B   |
| 5  | Liberty Grove Dr/Waterbury Dr   | Two-way stop | HCM 7th Edition | EB Left    | 0.008 | 10.9          | B   |
| 6  | Liberty Grove Dr/Salem Ct       | Two-way stop | HCM 7th Edition | EB Left    | 0.011 | 10.7          | B   |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Turn lane evaluations are shown in Table 16.

As shown in Table 14, and Table 15 all intersections operate at an acceptable LOS except for the intersection of Londonderry Drive/Liberty Grove Drive (#3) in the AM peak hour. Although the northbound left-turn movement operates at LOS E during the AM peak hour, the queue is no more than 0.5 vehicle, and the approach operates at an acceptable LOS. Matrix recommends an exclusive northbound left-turn lane at this intersection to avoid delay for other movements on this approach. See Table 16 for more information. The turn lane can be achieved by striping.

**Table 16. Horizon (2045) With Project Turn Lane Evaluations**

| ID | Intersection                       | Movement | Turning Volume (vph) | Queue (ft) | Deceleration (ft) | Taper (ft) | Storage (ft) | Total (ft) | Notes                                                                                                                                                                                                                                                                                                                               |
|----|------------------------------------|----------|----------------------|------------|-------------------|------------|--------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Meridian Rd/Stapleton Dr           | NBL      | 474                  | 260        | 235               | 400        | 260          | 895        | 5-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                     |
|    |                                    | NBR      | 728                  | -          | 235               | 200        | -            | 435        |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | SBL      | 216                  | 167        | 235               | 400        | 167          | 800        | 5-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                     |
|    |                                    | SBR      | 39                   | 15         | 235               | 200        | 15           | 450        | 10-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                    |
|    |                                    | EBL      | 85                   | 56         | 235               | 400        | 56           | 690        |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | EBR      | 531                  | -          | 235               | 200        | -            | 435        |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | WBL      | 660                  | 438        | 235               | 400        | 438          | 1075       |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | WBR      | 292                  | -          | 235               | 200        | -            | 435        |                                                                                                                                                                                                                                                                                                                                     |
| 2  | Meridian Rd/Londonderry Dr         | NBL      | 234                  | 240        | 235               | 200        | 240          | 675        |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | NBR      | 697                  | 254        | 235               | 200        | 254          | 690        |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | SBL      | 209                  | 114        | 235               | 200        | 114          | 550        |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | SBR      | 126                  | 55         | 235               | 200        | 55           | 490        | 10-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                    |
|    |                                    | EBL      | 222                  | 187        | 155               | 160        | 187          | 500        | 45-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                    |
|    |                                    | EBR      | 541                  | 326        | 155               | 160        | 326          | 640        | 40-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                    |
|    |                                    | WBL      | 750                  | 420        | 155               | 320        | 420          | 895        | 20-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                    |
|    |                                    | WBR      | 319                  | 146        | 155               | 160        | 146          | 460        | 15-ft Extension with respect to the Horizon Background scenario.                                                                                                                                                                                                                                                                    |
| 3  | Londonderry Drive/Liberty Grove Dr | NBL      | 15                   | 12         | 115               | 120        | 50           | 285        | The turn lane can be achieved by striping the roadway                                                                                                                                                                                                                                                                               |
|    |                                    | NBR      | 130                  | 40         |                   |            |              |            |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | EBR      | 30                   | 0          | Not Required      |            |              |            |                                                                                                                                                                                                                                                                                                                                     |
|    |                                    | WBL      | 33                   | 2          | 155               | 160        | 50           | 365        |                                                                                                                                                                                                                                                                                                                                     |
| 4  | Stapleton Dr/Liberty Grove Dr      | WBR      | 178                  | 0          | 235               | 200        |              | 435        | Currently, a 285-foot turn lane is provided at this intersection. If the southbound right-turn lane at Meridian Road and Stapleton Drive (#1) is required to operate as a free and channelized right-turn in the horizon year, then the existing westbound right-turn lane length is sufficient to avoid unsafe weaving conditions. |

#### Meridian Road/Stapleton Drive (#1)

- A 5-ft extension of northbound left-turn with respect to the Horizon Background scenario.
- A 5-ft extension of southbound left-turn with respect to the Horizon Background scenario.
- A 10-ft extension of southbound right-turn with respect to the Horizon Background scenario.

#### Meridian Road/Londonderry Drive (#2)

- A 45-ft extension of eastbound left-turn with respect to the Horizon Background scenario.
- A 40-ft extension of eastbound right-turn with respect to the Horizon Background scenario.
- A 20-ft extension of westbound left-turn with respect to the Horizon Background scenario.
- A 15-ft extension of westbound right-turn with respect to the Horizon Background scenario.

**Londonderry Drive/Liberty Grove Drive (#3)**

- A 285-ft northbound left-turn lane. Include a 120-ft of taper, a 115-ft of deceleration lane and a 50-ft of storage. This turn lane can be achieved by striping the roadway.

## Conclusions and Recommendations

In this study, the traffic impact of Falcon Reserve on the adjacent roadways was assessed. The summary of the required incremental improvements is as follows:

**Existing conditions required improvements:**

Summary of turn lane improvements are as follows:

**Meridian Road/Stapleton Drive (#1)**

- A new signal timing.
- A 165-ft extension of eastbound left-turn.
- A 260-ft extension of eastbound right-turn.
- Double westbound left-turn

**Meridian Road/Londonderry Drive (#2)**

- A new signal timing plan.
- A 160-ft extension of eastbound left-turn.
- A 165-ft extension of eastbound right-turn.
- Double westbound left-turn.
- A 125-ft extension of westbound right-turn.

**Liberty Grove Drive/Stapleton Drive (#4)**

- A 250-ft southbound left-turn lane. Included a 115-ft deceleration lane, a 85-ft taper lane and 50-ft of storage.

**Buildout (2028) Improvements:****Meridian Road/Stapleton Drive (#1)**

- A 25-ft extension of eastbound left-turn.
- An 85-ft extension of eastbound right-turn.

**Meridian Road/Londonderry (#2)**

- A 30-ft extension of eastbound right-turn lane.

**Londonderry Drive/Liberty Grove Drive (#3)**

- A 365-ft westbound left-turn. Included a 155-ft deceleration lane, a 160-ft taper and 50-ft of storage. This turn lane can be achieved by re-striping the roadway.

#### **Liberty Grove Drive/Stapleton Drive (#4)**

- A 250-ft southbound left-turn lane due to limited spacing between Stapleton Drive and Waterbury Drive. The turn lane can fully accommodate the queue.
- A 150-ft extension of westbound right-turn lane.

Lane stripping for SB and NB turn lanes and lane delineation along Liberty Grove in front of the development will be required at time of build out. For turn lane requirements in the buildout year see Table 10.

#### **Horizon (2045) Improvements:**

##### **Meridian Road/Stapleton Drive (#1)**

- Double northbound left-turn. Included a 400-ft taper, 235-ft deceleration lanes, and two 260-ft storage lanes. (895-ft in total)
- Double southbound left-turn. Included a 400-ft taper, 235-ft deceleration lane, and two 167-ft storage (805-ft in total).
- Double eastbound left-turn. Included a 400-ft taper, 235-ft deceleration lane, and two 56-ft storage (690-ft in total).
- A 260-ft extension of westbound left-turn.

##### **Meridian Road/Londonderry Drive (#2)**

- A 90-ft extension of eastbound left-turn.
- A 160-ft extension of eastbound right-turn.
- A 200-ft extension of westbound left-turn.
- A 70-ft extension of westbound right-turn.

##### **Londonderry Drive/Liberty Grove Drive (#3)**

- A 285-ft northbound left-turn lane. Include a 120-ft of taper, a 115-ft of deceleration lane and a 50-ft of storage. This turn lane can be achieved by striping the roadway.

For turn lane requirements in the horizon year see Table 16.

#### **Notes:**

- 1) The improvements along Stapleton Drive have already been programmed and should be reimbursable. For more information, see MTCP Table 9 – County Road Widening Projects or *the Briargate/Stapleton Drive Corridor Study*. Stapleton Drive is planned to be widened to a four-lane roadway, and access to Liberty Grove Drive is planned to be converted to right-in/right-out (RIRO) access. Fair share calculations are provided for the extension of westbound right-turn lane at Stapleton Drive/Liberty Grove Drive (#4).
- 2) Although this report strictly follows the EPC ECM, the southbound left-turn lane at Liberty Grove Drive and Stapleton Drive (#4) in the interim condition needs to be shortened due to limited spacing between the Waterbury Drive and Stapleton Drive.

- 3) It was assumed that 100 percent of the trips generated by this development will be made by personal vehicles, and no multi-modal adjustment was applied to the projected trip generation.
- 4) The internal roadways should all be classified as a local roads due to the low daily volumes generated by this development.
- 5) *The Briargate/Stapleton Dr corridor study* anticipate detached sidewalk along Stapleton Drive. The project will provide standard sidewalk, curb and gutter along the east side of Liberty Grove from the northernmost side of the project to Stapleton Drive to ensure an integrated pedestrian path, specifically, to provide a continuous connection to and from Falcon Middle School, located approximately 1,250 feet west of the project.

The summary of required improvements for the with project scenarios is outlined in Table 17. The project's 2028 and 2045 fair share for the required improvements is summarized in Table 18 and Table 19, respectively.

**Table 17. Summary of Required Improvements**

| ID | Intersection                     | Improvement                                                                                                                                                                                                               |
|----|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Meridian Rd/Stapleton Dr         | A 25-ft extension of eastbound left-turn.<br>An 85-ft extension of eastbound right-turn.                                                                                                                                  |
| 2  | Meridian Rd/Londonderry Dr       | A 30-ft extension of eastbound right-turn lane.                                                                                                                                                                           |
| 3  | Londonderry Dr/ Liberty Grove Dr | A 365-ft westbound left-turn. Include a 155-ft deceleration lane, a 160-ft taper and 50-ft of storage. This turn lane can be achieved by re-striping the roadway.                                                         |
| 4  | Stapleton Dr/Liberty Grove Dr    | A 250-ft southbound left-turn. Include 25-ft of taper and 225-ft of deceleration lane.<br>A 150-ft extension of westbound right-turn lane. Include 200-ft of taper and 235-ft of deceleration lane for a total of 435-ft. |
| 5  | Liberty Grove Dr/Waterbury Dr    | A shared westbound left/thru/right lane.                                                                                                                                                                                  |
| 6  | Liberty Grove Dr/Salem Ct        | A shared westbound left/thru/right lane.                                                                                                                                                                                  |

**Table 18. 2028 Fair Share Calculations**

| ID | Intersection                    | 2028 Total AM | 2028 Total PM | Site AM | Site PM | Existing AM | Existing PM | Fairshare 2028 AM | Fairshare 2028 PM | Fairshare 2028 (Weighted Average) |
|----|---------------------------------|---------------|---------------|---------|---------|-------------|-------------|-------------------|-------------------|-----------------------------------|
| 1  | Meridian Rd/Stapleton Dr        | 3169          | 3276          | 84      | 113     | 2735        | 2805        | 19.35%            | 23.99%            | 21.71%                            |
| 2  | Meridian Rd/Londonderry Dr      | 2663          | 2352          | 54      | 70      | 2311        | 2024        | 15.34%            | 21.34%            | 18.16%                            |
| 3  | Londonderry Rd/Liberty Grove Dr | 957           | 400           | 30      | 38      | 821         | 321         | 22.06%            | 48.10%            | 29.74%                            |

**Table 19. 2045 Fair Share Calculations**

| ID | Intersection                    | 2045 Total AM | 2045 Total PM | 2045 Site AM | 2045 Site PM | Existing AM | Existing PM | Fairshare 2045 AM | Fairshare 2045 PM | Fairshare 2045 (Weighted Average) |
|----|---------------------------------|---------------|---------------|--------------|--------------|-------------|-------------|-------------------|-------------------|-----------------------------------|
| 1  | Meridian Rd/Stapleton Dr        | 5328          | 5530          | 34           | 57           | 2735        | 2805        | 1.31%             | 2.09%             | 1.71%                             |
| 2  | Meridian Rd/Londonderry Dr      | 4428          | 3896          | 72           | 83           | 2311        | 2024        | 3.40%             | 4.43%             | 3.88%                             |
| 3  | Londonderry Rd/Liberty Grove Dr | 1659          | 733           | 111          | 118          | 821         | 321         | 13.25%            | 28.64%            | 17.96%                            |

Finally, the applicant is required to pay road impact fees to El Paso County. The County allows the applicant to pay three different upfront fee amounts. The applicant can either pay the full fee amount, a smaller upfront fee to the 5 mill Public Improvement District (PID), or an even smaller upfront fee amount to the 10 mill PID. The applicant will choose which fee method to follow at a later date. If the applicant chooses one of the PIDs, the PID will collect taxes over time. Any improvements along EPC designated roadways are eligible for partial reimbursement. Table 20 summarizes the road impact fees.

**Table 20. Roadway Impact Fee**

| Land Use             |                    | Unit            | Size       | Full Fee         | 5 Mill PID       | 10 Mill PID     |
|----------------------|--------------------|-----------------|------------|------------------|------------------|-----------------|
| <i>Single-Family</i> | <i>Residential</i> | <i>Dwelling</i> | <i>160</i> | <i>\$656,160</i> | <i>\$315,840</i> | <i>\$46,880</i> |

## **Appendix A – Traffic Counts**



ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

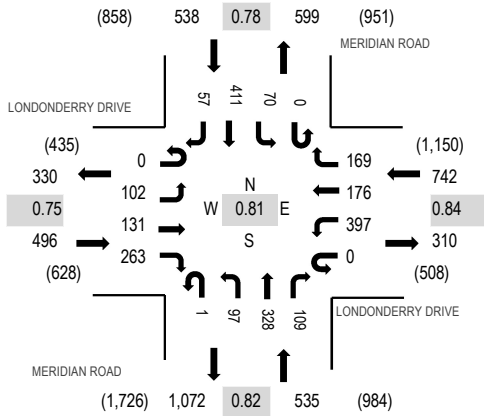
Location: 1 MERIDIAN ROAD & LONDONDERRY DRIVE AM

Date: Tuesday, April 2, 2024

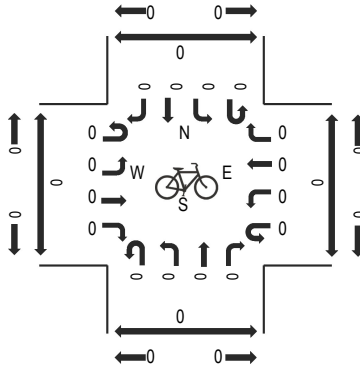
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

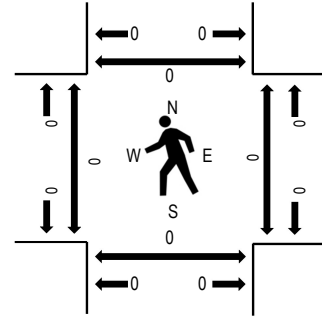
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | LONDONDERRY DRIVE |      |      |       | LONDONDERRY DRIVE |      |      |       | MERIDIAN ROAD |      |      |       | MERIDIAN ROAD |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|-------------------|------|------|-------|-------------------|------|------|-------|---------------|------|------|-------|---------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | Eastbound         |      |      |       | Westbound         |      |      |       | Northbound    |      |      |       | Southbound    |      |      |       |       |                 | West                 | East | South | North |
|                        | U-Turn            | Left | Thru | Right | U-Turn            | Left | Thru | Right | U-Turn        | Left | Thru | Right | U-Turn        | Left | Thru | Right |       |                 |                      |      |       |       |
| 7:00 AM                | 0                 | 18   | 19   | 35    | 0                 | 126  | 29   | 40    | 0             | 10   | 41   | 24    | 0             | 9    | 69   | 5     | 425   | 2,311           | 0                    | 0    | 0     | 0     |
| 7:15 AM                | 0                 | 22   | 39   | 66    | 0                 | 98   | 60   | 39    | 0             | 22   | 81   | 14    | 0             | 16   | 106  | 12    | 575   | 2,233           | 0                    | 0    | 0     | 0     |
| 7:30 AM                | 0                 | 30   | 46   | 90    | 0                 | 95   | 74   | 53    | 1             | 40   | 114  | 26    | 0             | 19   | 112  | 17    | 717   | 2,036           | 0                    | 0    | 0     | 0     |
| 7:45 AM                | 0                 | 32   | 27   | 72    | 0                 | 78   | 13   | 37    | 0             | 25   | 92   | 45    | 0             | 26   | 124  | 23    | 594   | 1,626           | 0                    | 0    | 0     | 0     |
| 8:00 AM                | 0                 | 10   | 9    | 21    | 0                 | 85   | 3    | 22    | 0             | 15   | 56   | 42    | 0             | 17   | 59   | 8     | 347   | 1,309           | 0                    | 0    | 0     | 0     |
| 8:15 AM                | 0                 | 10   | 5    | 19    | 0                 | 100  | 5    | 16    | 0             | 19   | 86   | 36    | 0             | 6    | 67   | 9     | 378   |                 | 0                    | 0    | 0     | 0     |
| 8:30 AM                | 0                 | 11   | 7    | 14    | 1                 | 81   | 1    | 10    | 0             | 14   | 64   | 26    | 0             | 10   | 61   | 7     | 307   |                 | 0                    | 0    | 0     | 0     |
| 8:45 AM                | 0                 | 6    | 5    | 15    | 0                 | 65   | 8    | 11    | 0             | 15   | 50   | 26    | 0             | 8    | 67   | 1     | 277   |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                 | 139  | 157  | 332   | 1                 | 728  | 193  | 228   | 1             | 160  | 584  | 239   | 0             | 111  | 665  | 82    | 3,620 |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0                 | 102  | 131  | 263   | 0                 | 397  | 176  | 169   | 1             | 97   | 328  | 109   | 0             | 70   | 411  | 57    | 2,311 |                 | 0                    | 0    | 0     | 0     |



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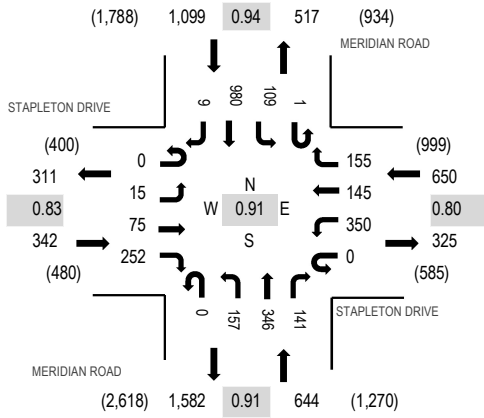
Location: 2 MERIDIAN ROAD & STAPLETON DRIVE AM

Date: Tuesday, April 2, 2024

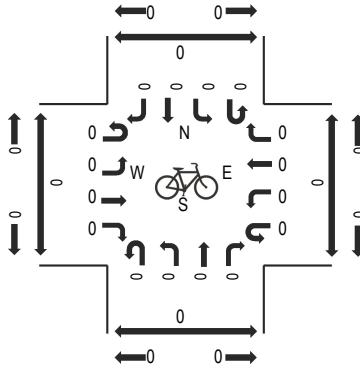
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

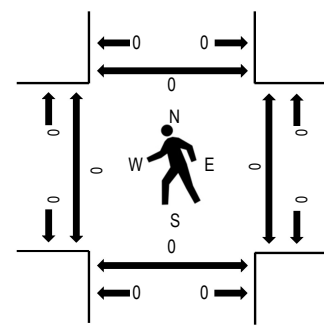
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | STAPLETON DRIVE<br>Eastbound |      |      |       | STAPLETON DRIVE<br>Westbound |      |      |       | MERIDIAN ROAD<br>Northbound |      |      |       | MERIDIAN ROAD<br>Southbound |      |       |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|------------------------------|------|------|-------|------------------------------|------|------|-------|-----------------------------|------|------|-------|-----------------------------|------|-------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                       | Left | Thru | Right | U-Turn                       | Left | Thru | Right | U-Turn                      | Left | Thru | Right | U-Turn                      | Left | Thru  | Right |       |                 | West                 | East | South | North |
| 7:00 AM                | 0                            | 5    | 16   | 44    | 0                            | 94   | 23   | 24    | 0                           | 33   | 48   | 41    | 0                           | 19   | 229   | 0     | 576   | 2,735           | 0                    | 0    | 0     | 0     |
| 7:15 AM                | 0                            | 2    | 23   | 73    | 0                            | 82   | 62   | 39    | 0                           | 51   | 93   | 38    | 0                           | 27   | 243   | 3     | 736   | 2,637           | 0                    | 0    | 0     | 0     |
| 7:30 AM                | 0                            | 5    | 20   | 78    | 0                            | 95   | 52   | 55    | 0                           | 42   | 88   | 22    | 0                           | 27   | 260   | 4     | 748   | 2,356           | 0                    | 0    | 0     | 0     |
| 7:45 AM                | 0                            | 3    | 16   | 57    | 0                            | 79   | 8    | 37    | 0                           | 31   | 117  | 40    | 1                           | 36   | 248   | 2     | 675   | 2,078           | 0                    | 0    | 0     | 0     |
| 8:00 AM                | 0                            | 2    | 5    | 26    | 0                            | 89   | 5    | 9     | 0                           | 18   | 96   | 48    | 0                           | 11   | 167   | 2     | 478   | 1,802           | 0                    | 0    | 0     | 0     |
| 8:15 AM                | 0                            | 0    | 4    | 30    | 0                            | 52   | 2    | 15    | 0                           | 17   | 100  | 44    | 0                           | 16   | 175   | 0     | 455   |                 | 0                    | 0    | 0     | 0     |
| 8:30 AM                | 0                            | 1    | 5    | 30    | 0                            | 81   | 4    | 11    | 0                           | 18   | 82   | 46    | 0                           | 18   | 174   | 0     | 470   |                 | 0                    | 0    | 0     | 0     |
| 8:45 AM                | 0                            | 1    | 4    | 30    | 0                            | 68   | 6    | 7     | 0                           | 17   | 93   | 47    | 0                           | 12   | 114   | 0     | 399   |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                            | 19   | 93   | 368   | 0                            | 640  | 162  | 197   | 0                           | 227  | 717  | 326   | 1                           | 166  | 1,610 | 11    | 4,537 |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0                            | 15   | 75   | 252   | 0                            | 350  | 145  | 155   | 0                           | 157  | 346  | 141   | 1                           | 109  | 980   | 9     | 2,735 |                 | 0                    | 0    | 0     | 0     |



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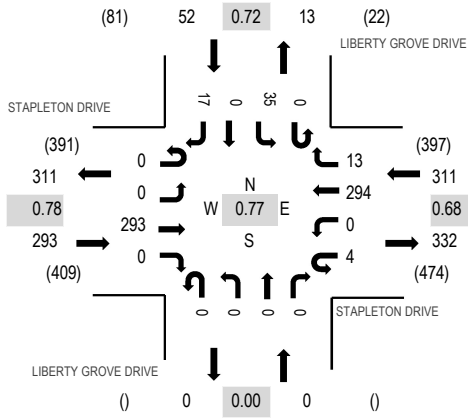
Location: 3 LIBERTY GROVE DRIVE & STAPLETON DRIVE AM

Date: Tuesday, April 2, 2024

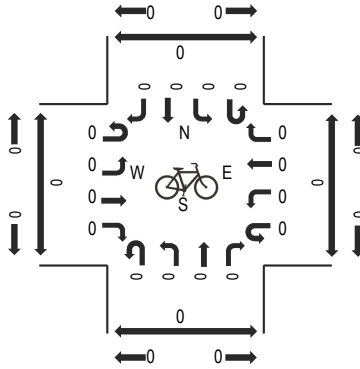
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:15 AM - 07:30 AM

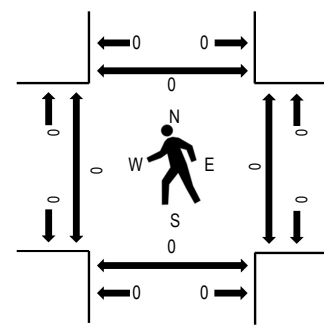
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | STAPLETON DRIVE<br>Eastbound |      |      |       | STAPLETON DRIVE<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|------------------------------|------|------|-------|------------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                       | Left | Thru | Right | U-Turn                       | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 7:00 AM                | 0                            | 0    | 49   | 0     | 0                            | 0    | 52   | 4     | 0                                 | 0    | 0    | 0     | 0                                 | 10   | 0    | 0     | 115   | 656             | 0                    | 0    | 0     | 0     |
| 7:15 AM                | 0                            | 0    | 83   | 0     | 0                            | 0    | 112  | 2     | 0                                 | 0    | 0    | 0     | 0                                 | 13   | 0    | 2     | 212   | 599             | 0                    | 0    | 0     | 0     |
| 7:30 AM                | 0                            | 0    | 94   | 0     | 4                            | 0    | 91   | 5     | 0                                 | 0    | 0    | 0     | 0                                 | 10   | 0    | 8     | 212   | 441             | 0                    | 0    | 0     | 0     |
| 7:45 AM                | 0                            | 0    | 67   | 0     | 0                            | 0    | 39   | 2     | 0                                 | 0    | 0    | 0     | 0                                 | 2    | 0    | 7     | 117   | 282             | 0                    | 0    | 0     | 0     |
| 8:00 AM                | 0                            | 0    | 28   | 0     | 0                            | 0    | 24   | 1     | 0                                 | 0    | 0    | 0     | 0                                 | 3    | 0    | 2     | 58    | 231             | 0                    | 0    | 0     | 0     |
| 8:15 AM                | 0                            | 0    | 28   | 0     | 0                            | 0    | 16   | 2     | 0                                 | 0    | 0    | 0     | 0                                 | 8    | 0    | 0     | 54    |                 | 0                    | 0    | 0     | 0     |
| 8:30 AM                | 0                            | 0    | 29   | 0     | 0                            | 0    | 18   | 2     | 0                                 | 0    | 0    | 0     | 0                                 | 4    | 0    | 0     | 53    |                 | 0                    | 0    | 0     | 0     |
| 8:45 AM                | 0                            | 0    | 31   | 0     | 0                            | 0    | 19   | 4     | 0                                 | 0    | 0    | 0     | 0                                 | 11   | 0    | 1     | 66    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                            | 0    | 409  | 0     | 4                            | 0    | 371  | 22    | 0                                 | 0    | 0    | 0     | 0                                 | 61   | 0    | 20    | 887   |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0                            | 0    | 293  | 0     | 4                            | 0    | 294  | 13    | 0                                 | 0    | 0    | 0     | 0                                 | 35   | 0    | 17    | 656   |                 | 0                    | 0    | 0     | 0     |



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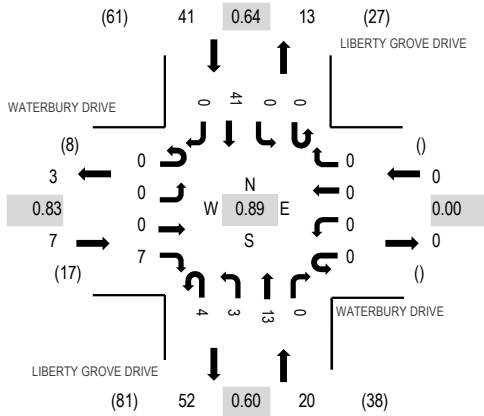
Location: 4 LIBERTY GROVE DRIVE &amp; WATERBURY DRIVE AM

Date: Tuesday, April 2, 2024

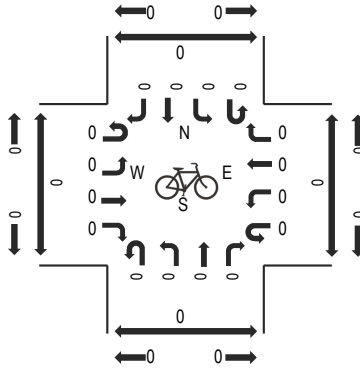
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

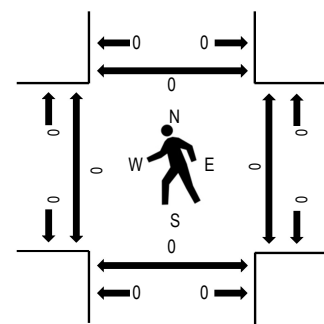
## Peak Hour - Motorized Vehicles



## Peak Hour - Bicycles



## Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

## Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | WATERBURY DRIVE |      |      |       | WATERBURY DRIVE |      |      |       | LIBERTY GROVE DRIVE |      |      |       | LIBERTY GROVE DRIVE |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|-----------------|------|------|-------|-----------------|------|------|-------|---------------------|------|------|-------|---------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | Eastbound       |      |      |       | Westbound       |      |      |       | Northbound          |      |      |       | Southbound          |      |      |       |       |                 | West                 | East | South | North |
|                        | U-Turn          | Left | Thru | Right | U-Turn          | Left | Thru | Right | U-Turn              | Left | Thru | Right | U-Turn              | Left | Thru | Right |       |                 |                      |      |       |       |
| 7:00 AM                | 0               | 0    | 0    | 2     | 0               | 0    | 0    | 0     | 1                   | 1    | 2    | 0     | 0                   | 0    | 7    | 0     | 13    | 68              | 0                    | 0    | 0     | 0     |
| 7:15 AM                | 0               | 0    | 0    | 4     | 0               | 0    | 0    | 0     | 2                   | 2    | 1    | 0     | 0                   | 0    | 9    | 0     | 18    | 64              | 0                    | 0    | 0     | 0     |
| 7:30 AM                | 0               | 0    | 0    | 1     | 0               | 0    | 0    | 0     | 1                   | 0    | 0    | 0     | 0                   | 0    | 16   | 0     | 18    | 61              | 0                    | 0    | 0     | 0     |
| 7:45 AM                | 0               | 0    | 0    | 0     | 0               | 0    | 0    | 0     | 0                   | 0    | 10   | 0     | 0                   | 0    | 9    | 0     | 19    | 51              | 0                    | 0    | 0     | 0     |
| 8:00 AM                | 0               | 1    | 0    | 1     | 0               | 0    | 0    | 0     | 0                   | 2    | 1    | 0     | 0                   | 0    | 4    | 0     | 9     | 48              | 0                    | 0    | 0     | 0     |
| 8:15 AM                | 0               | 0    | 0    | 2     | 0               | 0    | 0    | 0     | 0                   | 1    | 6    | 0     | 0                   | 0    | 6    | 0     | 15    |                 | 0                    | 0    | 0     | 0     |
| 8:30 AM                | 0               | 0    | 0    | 3     | 0               | 0    | 0    | 0     | 0                   | 2    | 2    | 0     | 0                   | 0    | 1    | 0     | 8     |                 | 0                    | 0    | 0     | 0     |
| 8:45 AM                | 0               | 0    | 0    | 3     | 0               | 0    | 0    | 0     | 0                   | 0    | 4    | 0     | 0                   | 0    | 9    | 0     | 16    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0               | 1    | 0    | 16    | 0               | 0    | 0    | 0     | 4                   | 8    | 26   | 0     | 0                   | 0    | 61   | 0     | 116   |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0               | 0    | 0    | 7     | 0               | 0    | 0    | 0     | 4                   | 3    | 13   | 0     | 0                   | 0    | 41   | 0     | 68    |                 | 0                    | 0    | 0     | 0     |



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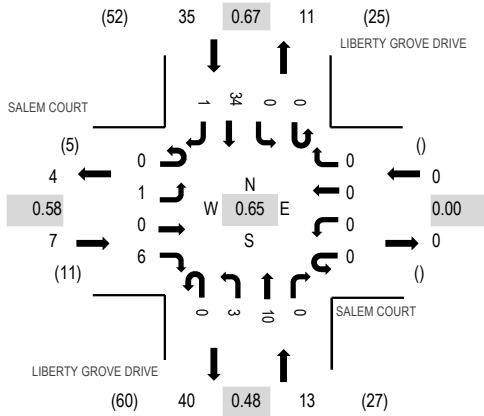
Location: 5 LIBERTY GROVE DRIVE &amp; SALEM COURT AM

Date: Tuesday, April 2, 2024

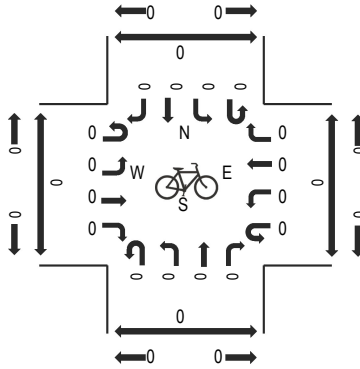
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

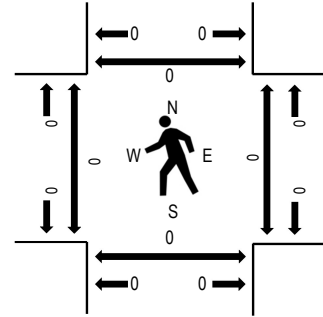
## Peak Hour - Motorized Vehicles



## Peak Hour - Bicycles



## Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

## Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | SALEM COURT<br>Eastbound |      |      |       | SALEM COURT<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|--------------------------|------|------|-------|--------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                   | Left | Thru | Right | U-Turn                   | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 7:00 AM                | 0                        | 0    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 2    | 0     | 0                                 | 0    | 5    | 0     | 8     | 55              | 0                    | 0    | 0     | 0     |
| 7:15 AM                | 0                        | 0    | 0    | 2     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 1    | 0     | 0                                 | 0    | 7    | 0     | 10    | 53              | 0                    | 0    | 0     | 0     |
| 7:30 AM                | 0                        | 0    | 0    | 3     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 0    | 0     | 0                                 | 0    | 13   | 0     | 16    | 55              | 0                    | 0    | 0     | 0     |
| 7:45 AM                | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 3    | 7    | 0     | 0                                 | 0    | 9    | 1     | 21    | 41              | 0                    | 0    | 0     | 0     |
| 8:00 AM                | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 2    | 0     | 0                                 | 0    | 4    | 0     | 6     | 35              | 0                    | 0    | 0     | 0     |
| 8:15 AM                | 0                        | 0    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                                 | 1    | 5    | 0     | 0                                 | 0    | 5    | 0     | 12    |                 | 0                    | 0    | 0     | 0     |
| 8:30 AM                | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 1    | 0     | 0                                 | 0    | 1    | 0     | 2     |                 | 0                    | 0    | 0     | 0     |
| 8:45 AM                | 0                        | 1    | 0    | 2     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 5    | 0     | 0                                 | 0    | 7    | 0     | 15    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                        | 2    | 0    | 9     | 0                        | 0    | 0    | 0     | 0                                 | 4    | 23   | 0     | 0                                 | 0    | 51   | 1     | 90    |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0                        | 1    | 0    | 6     | 0                        | 0    | 0    | 0     | 0                                 | 3    | 10   | 0     | 0                                 | 0    | 34   | 1     | 55    |                 | 0                    | 0    | 0     | 0     |



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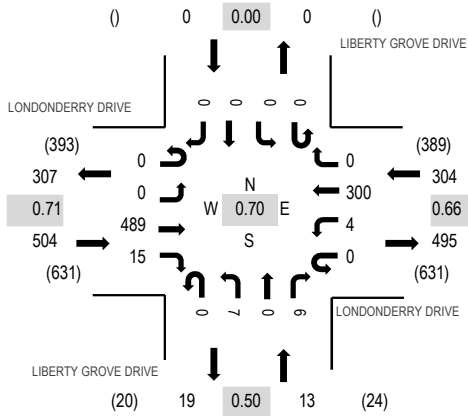
Location: 6 LIBERTY GROVE DRIVE & LONDONDERRY DRIVE AM

Date: Tuesday, April 2, 2024

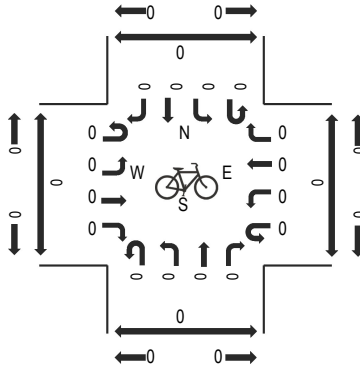
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

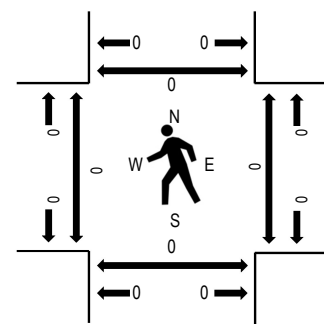
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | LONDONDERRY DRIVE<br>Eastbound |      |      |       | LONDONDERRY DRIVE<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|--------------------------------|------|------|-------|--------------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                         | Left | Thru | Right | U-Turn                         | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 7:00 AM                | 0                              | 0    | 70   | 0     | 0                              | 0    | 36   | 0     | 0                                 | 0    | 0    | 2     | 0                                 | 0    | 0    | 0     | 108   | 821             | 0                    | 0    | 0     | 0     |
| 7:15 AM                | 0                              | 0    | 125  | 3     | 0                              | 0    | 98   | 0     | 0                                 | 0    | 0    | 2     | 0                                 | 0    | 0    | 0     | 228   | 771             | 0                    | 0    | 0     | 0     |
| 7:30 AM                | 0                              | 0    | 173  | 4     | 0                              | 3    | 112  | 0     | 0                                 | 2    | 0    | 0     | 0                                 | 0    | 0    | 0     | 294   | 598             | 0                    | 0    | 0     | 0     |
| 7:45 AM                | 0                              | 0    | 121  | 8     | 0                              | 1    | 54   | 0     | 0                                 | 5    | 0    | 2     | 0                                 | 0    | 0    | 0     | 191   | 361             | 0                    | 0    | 0     | 0     |
| 8:00 AM                | 0                              | 0    | 37   | 0     | 0                              | 0    | 19   | 0     | 0                                 | 0    | 0    | 2     | 0                                 | 0    | 0    | 0     | 58    | 223             | 0                    | 0    | 0     | 0     |
| 8:15 AM                | 0                              | 0    | 33   | 0     | 0                              | 1    | 19   | 0     | 0                                 | 1    | 0    | 1     | 0                                 | 0    | 0    | 0     | 55    |                 | 0                    | 0    | 0     | 0     |
| 8:30 AM                | 0                              | 0    | 31   | 0     | 0                              | 0    | 23   | 0     | 0                                 | 0    | 0    | 3     | 0                                 | 0    | 0    | 0     | 57    |                 | 0                    | 0    | 0     | 0     |
| 8:45 AM                | 0                              | 0    | 26   | 0     | 0                              | 0    | 23   | 0     | 0                                 | 1    | 0    | 3     | 0                                 | 0    | 0    | 0     | 53    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                              | 0    | 616  | 15    | 0                              | 5    | 384  | 0     | 0                                 | 9    | 0    | 15    | 0                                 | 0    | 0    | 0     | 1,044 |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0                              | 0    | 489  | 15    | 0                              | 4    | 300  | 0     | 0                                 | 7    | 0    | 6     | 0                                 | 0    | 0    | 0     | 821   |                 | 0                    | 0    | 0     | 0     |



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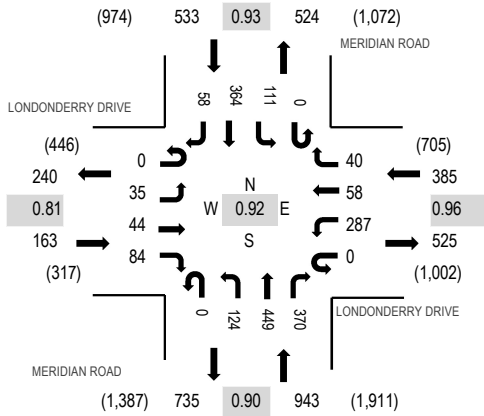
**Location:** 1 MERIDIAN ROAD & LONDONDERRY DRIVE PM

**Date:** Tuesday, April 2, 2024

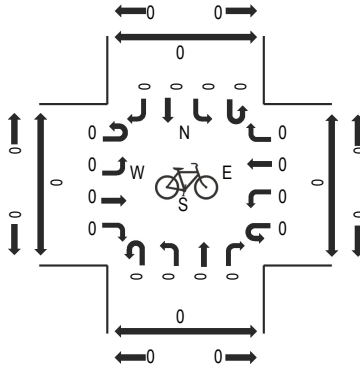
**Peak Hour:** 04:30 PM - 05:30 PM

**Peak 15-Minutes:** 05:15 PM - 05:30 PM

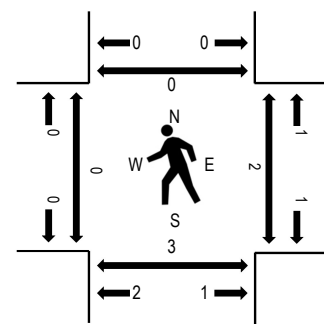
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | LONDONDERRY DRIVE<br>Eastbound |      |      |       | LONDONDERRY DRIVE<br>Westbound |      |      |       | MERIDIAN ROAD<br>Northbound |      |      |       | MERIDIAN ROAD<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|--------------------------------|------|------|-------|--------------------------------|------|------|-------|-----------------------------|------|------|-------|-----------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                         | Left | Thru | Right | U-Turn                         | Left | Thru | Right | U-Turn                      | Left | Thru | Right | U-Turn                      | Left | Thru | Right |       |                 | West                 | East | South | North |
| 4:00 PM                | 0                              | 5    | 5    | 25    | 0                              | 72   | 10   | 10    | 0                           | 27   | 102  | 96    | 0                           | 18   | 100  | 12    | 482   | 1,935           | 0                    | 0    | 1     | 0     |
| 4:15 PM                | 0                              | 8    | 8    | 19    | 0                              | 59   | 11   | 10    | 0                           | 37   | 135  | 96    | 0                           | 14   | 70   | 15    | 482   | 1,958           | 0                    | 0    | 1     | 0     |
| 4:30 PM                | 0                              | 5    | 8    | 28    | 0                              | 64   | 13   | 9     | 0                           | 34   | 114  | 88    | 0                           | 19   | 100  | 16    | 498   | 2,024           | 0                    | 2    | 2     | 0     |
| 4:45 PM                | 0                              | 7    | 7    | 14    | 0                              | 76   | 12   | 13    | 0                           | 31   | 96   | 92    | 0                           | 26   | 93   | 6     | 473   | 2,024           | 0                    | 0    | 1     | 0     |
| 5:00 PM                | 0                              | 10   | 12   | 17    | 0                              | 77   | 18   | 7     | 0                           | 33   | 106  | 82    | 0                           | 22   | 99   | 22    | 505   | 1,972           | 0                    | 0    | 0     | 0     |
| 5:15 PM                | 0                              | 13   | 17   | 25    | 0                              | 70   | 15   | 11    | 0                           | 26   | 133  | 108   | 0                           | 44   | 72   | 14    | 548   |                 | 0                    | 0    | 0     | 0     |
| 5:30 PM                | 0                              | 12   | 12   | 19    | 0                              | 68   | 5    | 18    | 0                           | 32   | 118  | 97    | 0                           | 19   | 82   | 16    | 498   |                 | 0                    | 0    | 0     | 0     |
| 5:45 PM                | 0                              | 9    | 10   | 22    | 0                              | 43   | 8    | 6     | 0                           | 28   | 115  | 85    | 0                           | 17   | 73   | 5     | 421   |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                              | 69   | 79   | 169   | 0                              | 529  | 92   | 84    | 0                           | 248  | 919  | 744   | 0                           | 179  | 689  | 106   | 3,907 |                 | 0                    | 2    | 5     | 0     |
| Peak Hour              | 0                              | 35   | 44   | 84    | 0                              | 287  | 58   | 40    | 0                           | 124  | 449  | 370   | 0                           | 111  | 364  | 58    | 2,024 |                 | 0                    | 2    | 3     | 0     |



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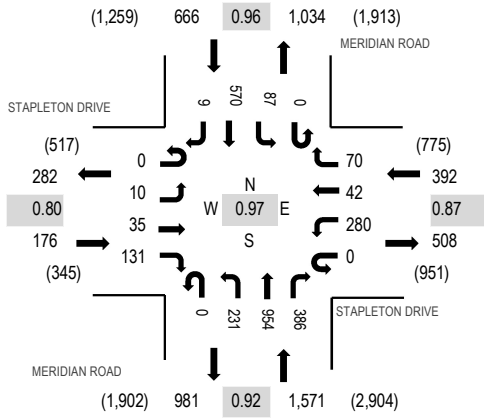
Location: 2 MERIDIAN ROAD & STAPLETON DRIVE PM

Date: Tuesday, April 2, 2024

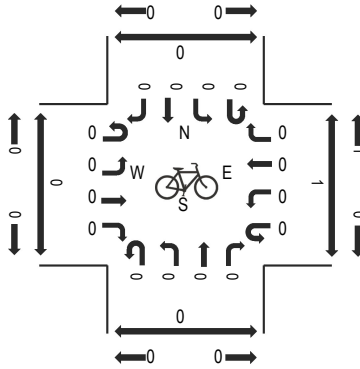
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

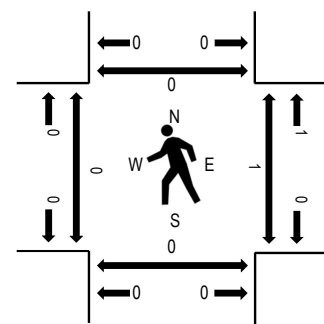
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | STAPLETON DRIVE<br>Eastbound |      |      |       | STAPLETON DRIVE<br>Westbound |      |      |       | MERIDIAN ROAD<br>Northbound |      |       |       | MERIDIAN ROAD<br>Southbound |      |       |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|------------------------------|------|------|-------|------------------------------|------|------|-------|-----------------------------|------|-------|-------|-----------------------------|------|-------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                       | Left | Thru | Right | U-Turn                       | Left | Thru | Right | U-Turn                      | Left | Thru  | Right | U-Turn                      | Left | Thru  | Right |       |                 | West                 | East | South | North |
| 4:00 PM                | 0                            | 2    | 5    | 39    | 0                            | 78   | 12   | 20    | 0                           | 35   | 181   | 68    | 0                           | 25   | 133   | 0     | 598   | 2,583           | 0                    | 0    | 0     | 0     |
| 4:15 PM                | 0                            | 1    | 6    | 37    | 0                            | 65   | 8    | 20    | 0                           | 43   | 194   | 97    | 0                           | 18   | 148   | 2     | 639   | 2,690           | 0                    | 0    | 0     | 0     |
| 4:30 PM                | 0                            | 3    | 9    | 32    | 0                            | 66   | 15   | 22    | 0                           | 58   | 213   | 95    | 0                           | 14   | 117   | 4     | 648   | 2,777           | 0                    | 0    | 0     | 0     |
| 4:45 PM                | 0                            | 1    | 6    | 28    | 0                            | 58   | 11   | 14    | 0                           | 70   | 262   | 93    | 0                           | 19   | 135   | 1     | 698   | 2,805           | 0                    | 0    | 0     | 0     |
| 5:00 PM                | 0                            | 2    | 15   | 40    | 0                            | 82   | 19   | 15    | 0                           | 50   | 232   | 85    | 0                           | 27   | 134   | 4     | 705   | 2,700           | 0                    | 0    | 0     | 0     |
| 5:15 PM                | 0                            | 5    | 4    | 37    | 0                            | 77   | 3    | 21    | 0                           | 56   | 258   | 92    | 0                           | 22   | 151   | 0     | 726   |                 | 0                    | 0    | 0     | 0     |
| 5:30 PM                | 0                            | 2    | 10   | 26    | 0                            | 63   | 9    | 20    | 0                           | 55   | 202   | 116   | 0                           | 19   | 150   | 4     | 676   |                 | 0                    | 1    | 0     | 0     |
| 5:45 PM                | 0                            | 0    | 4    | 31    | 0                            | 58   | 6    | 13    | 0                           | 52   | 210   | 87    | 0                           | 15   | 117   | 0     | 593   |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                            | 16   | 59   | 270   | 0                            | 547  | 83   | 145   | 0                           | 419  | 1,752 | 733   | 0                           | 159  | 1,085 | 15    | 5,283 |                 | 0                    | 1    | 0     | 0     |
| Peak Hour              | 0                            | 10   | 35   | 131   | 0                            | 280  | 42   | 70    | 0                           | 231  | 954   | 386   | 0                           | 87   | 570   | 9     | 2,805 |                 | 0                    | 1    | 0     | 0     |



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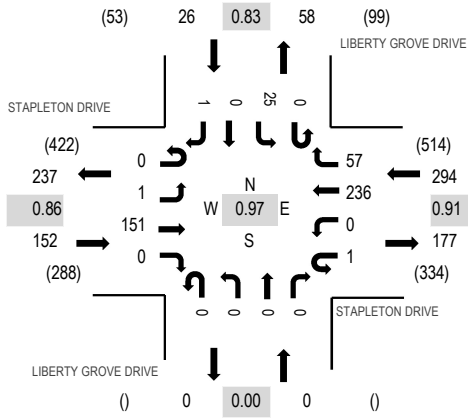
Location: 3 LIBERTY GROVE DRIVE & STAPLETON DRIVE PM

Date: Tuesday, April 2, 2024

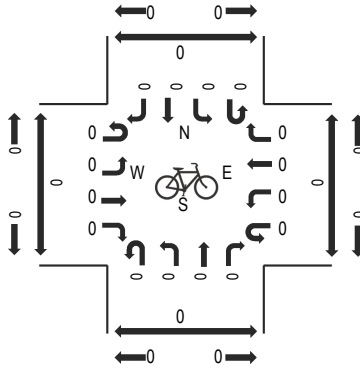
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

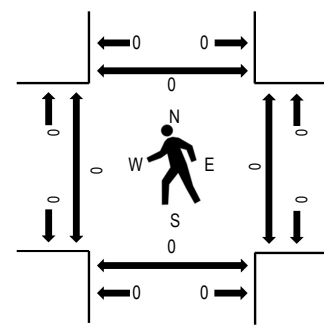
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | STAPLETON DRIVE<br>Eastbound |      |      |       | STAPLETON DRIVE<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|------------------------------|------|------|-------|------------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                       | Left | Thru | Right | U-Turn                       | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 4:00 PM                | 0                            | 0    | 40   | 0     | 0                            | 0    | 37   | 8     | 0                                 | 0    | 0    | 0     | 0                                 | 2    | 0    | 0     | 87    | 421             | 0                    | 0    | 0     | 0     |
| 4:15 PM                | 0                            | 0    | 37   | 0     | 0                            | 0    | 42   | 13    | 0                                 | 0    | 0    | 0     | 0                                 | 8    | 0    | 0     | 100   | 456             | 0                    | 0    | 0     | 0     |
| 4:30 PM                | 0                            | 0    | 39   | 0     | 0                            | 0    | 61   | 12    | 0                                 | 0    | 0    | 0     | 0                                 | 8    | 0    | 1     | 121   | 472             | 0                    | 0    | 0     | 0     |
| 4:45 PM                | 0                            | 0    | 26   | 0     | 0                            | 0    | 66   | 15    | 0                                 | 0    | 0    | 0     | 0                                 | 6    | 0    | 0     | 113   | 456             | 0                    | 0    | 0     | 0     |
| 5:00 PM                | 0                            | 0    | 44   | 0     | 0                            | 0    | 61   | 10    | 0                                 | 0    | 0    | 0     | 0                                 | 7    | 0    | 0     | 122   | 434             | 0                    | 0    | 0     | 0     |
| 5:15 PM                | 0                            | 1    | 42   | 0     | 1                            | 0    | 48   | 20    | 0                                 | 0    | 0    | 0     | 0                                 | 4    | 0    | 0     | 116   |                 | 0                    | 0    | 0     | 0     |
| 5:30 PM                | 0                            | 0    | 30   | 0     | 0                            | 0    | 55   | 11    | 0                                 | 0    | 0    | 0     | 0                                 | 8    | 0    | 1     | 105   |                 | 0                    | 0    | 0     | 0     |
| 5:45 PM                | 0                            | 2    | 27   | 0     | 0                            | 0    | 47   | 7     | 0                                 | 0    | 0    | 0     | 0                                 | 5    | 0    | 3     | 91    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                            | 3    | 285  | 0     | 1                            | 0    | 417  | 96    | 0                                 | 0    | 0    | 0     | 0                                 | 48   | 0    | 5     | 855   |                 | 0                    | 0    | 0     | 0     |
| Peak Hour              | 0                            | 1    | 151  | 0     | 1                            | 0    | 236  | 57    | 0                                 | 0    | 0    | 0     | 0                                 | 25   | 0    | 1     | 472   |                 | 0                    | 0    | 0     | 0     |



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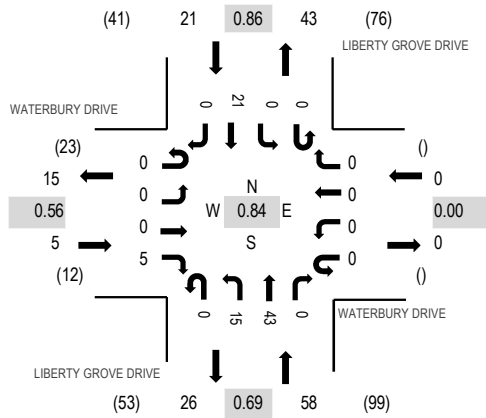
Location: 4 LIBERTY GROVE DRIVE & WATERBURY DRIVE PM

Date: Tuesday, April 2, 2024

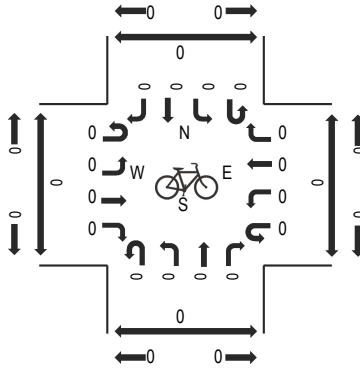
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

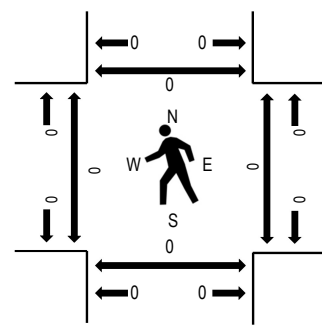
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | WATERBURY DRIVE<br>Eastbound |      |      |       | WATERBURY DRIVE<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|------------------------------|------|------|-------|------------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                       | Left | Thru | Right | U-Turn                       | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 4:00 PM                | 0                            | 0    | 0    | 0     | 0                            | 0    | 0    | 0     | 0                                 | 0    | 8    | 0     | 0                                 | 0    | 2    | 0     | 10    | 73              | 0                    | 0    | 0     | 0     |
| 4:15 PM                | 0                            | 0    | 0    | 1     | 0                            | 0    | 0    | 0     | 0                                 | 3    | 10   | 0     | 0                                 | 0    | 7    | 0     | 21    | 80              | 0                    | 0    | 0     | 0     |
| 4:30 PM                | 0                            | 0    | 0    | 2     | 0                            | 0    | 0    | 0     | 0                                 | 5    | 7    | 0     | 0                                 | 0    | 7    | 0     | 21    | 84              | 0                    | 0    | 0     | 0     |
| 4:45 PM                | 0                            | 0    | 0    | 0     | 0                            | 0    | 0    | 0     | 0                                 | 1    | 14   | 0     | 0                                 | 0    | 6    | 0     | 21    | 83              | 0                    | 0    | 0     | 0     |
| 5:00 PM                | 0                            | 0    | 0    | 3     | 0                            | 0    | 0    | 0     | 0                                 | 3    | 7    | 0     | 0                                 | 0    | 4    | 0     | 17    | 79              | 0                    | 0    | 0     | 0     |
| 5:15 PM                | 0                            | 0    | 0    | 0     | 0                            | 0    | 0    | 0     | 0                                 | 6    | 15   | 0     | 0                                 | 0    | 4    | 0     | 25    |                 | 0                    | 0    | 0     | 0     |
| 5:30 PM                | 0                            | 0    | 0    | 4     | 0                            | 0    | 0    | 0     | 0                                 | 2    | 9    | 0     | 0                                 | 0    | 5    | 0     | 20    |                 | 0                    | 0    | 0     | 1     |
| 5:45 PM                | 0                            | 1    | 0    | 1     | 0                            | 0    | 0    | 0     | 1                                 | 3    | 5    | 0     | 0                                 | 0    | 6    | 0     | 17    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                            | 1    | 0    | 11    | 0                            | 0    | 0    | 0     | 1                                 | 23   | 75   | 0     | 0                                 | 0    | 41   | 0     | 152   |                 | 0                    | 0    | 0     | 1     |
| Peak Hour              | 0                            | 0    | 0    | 5     | 0                            | 0    | 0    | 0     | 0                                 | 15   | 43   | 0     | 0                                 | 0    | 21   | 0     | 84    |                 | 0                    | 0    | 0     | 0     |



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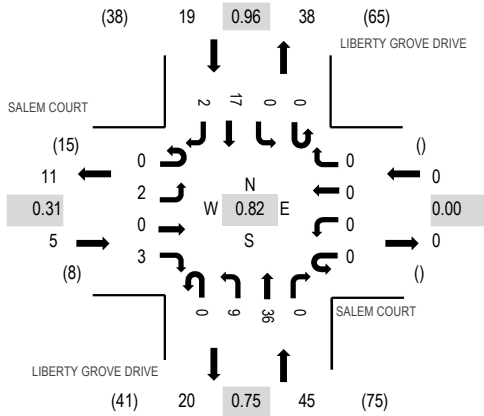
Location: 5 LIBERTY GROVE DRIVE &amp; SALEM COURT PM

Date: Tuesday, April 2, 2024

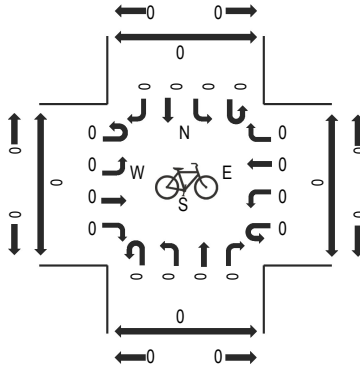
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

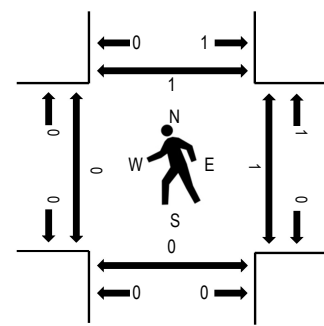
## Peak Hour - Motorized Vehicles



## Peak Hour - Bicycles



## Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

## Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | SALEM COURT<br>Eastbound |      |      |       | SALEM COURT<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|--------------------------|------|------|-------|--------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                   | Left | Thru | Right | U-Turn                   | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 4:00 PM                | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 2    | 5    | 0     | 0                                 | 0    | 2    | 0     | 9     | 62              | 0                    | 0    | 0     | 0     |
| 4:15 PM                | 0                        | 0    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 11   | 0     | 0                                 | 0    | 6    | 0     | 18    | 66              | 0                    | 0    | 0     | 0     |
| 4:30 PM                | 0                        | 0    | 0    | 2     | 0                        | 0    | 0    | 0     | 0                                 | 1    | 6    | 0     | 0                                 | 0    | 5    | 0     | 14    | 67              | 0                    | 0    | 0     | 0     |
| 4:45 PM                | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 6    | 8    | 0     | 0                                 | 0    | 6    | 0     | 21    | 69              | 0                    | 0    | 0     | 0     |
| 5:00 PM                | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 7    | 0     | 0                                 | 0    | 4    | 2     | 13    | 59              | 0                    | 0    | 0     | 0     |
| 5:15 PM                | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 2    | 13   | 0     | 0                                 | 0    | 4    | 0     | 19    |                 | 0                    | 0    | 0     | 1     |
| 5:30 PM                | 0                        | 1    | 0    | 3     | 0                        | 0    | 0    | 0     | 0                                 | 1    | 8    | 0     | 0                                 | 0    | 3    | 0     | 16    |                 | 0                    | 1    | 0     | 0     |
| 5:45 PM                | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                                 | 0    | 5    | 0     | 0                                 | 0    | 5    | 1     | 11    |                 | 0                    | 1    | 0     | 0     |
| Count Total            | 0                        | 2    | 0    | 6     | 0                        | 0    | 0    | 0     | 0                                 | 12   | 63   | 0     | 0                                 | 0    | 35   | 3     | 121   |                 | 0                    | 2    | 0     | 1     |
| Peak Hour              | 0                        | 2    | 0    | 3     | 0                        | 0    | 0    | 0     | 0                                 | 9    | 36   | 0     | 0                                 | 0    | 17   | 2     | 69    |                 | 0                    | 1    | 0     | 1     |



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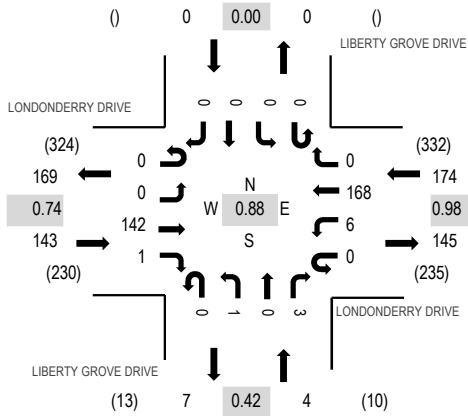
Location: 6 LIBERTY GROVE DRIVE & LONDONDERRY DRIVE PM

Date: Tuesday, April 2, 2024

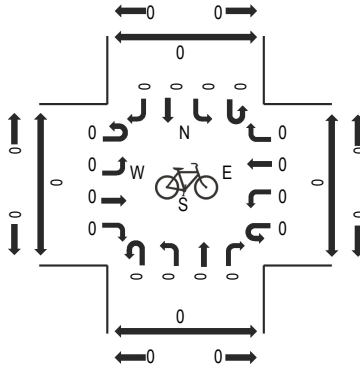
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:30 PM - 05:45 PM

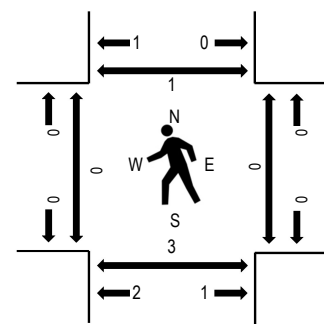
### Peak Hour - Motorized Vehicles



### Peak Hour - Bicycles



### Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

### Traffic Counts - Motorized Vehicles

| Interval<br>Start Time | LONDONDERRY DRIVE<br>Eastbound |      |      |       | LONDONDERRY DRIVE<br>Westbound |      |      |       | LIBERTY GROVE DRIVE<br>Northbound |      |      |       | LIBERTY GROVE DRIVE<br>Southbound |      |      |       | Total | Rolling<br>Hour | Pedestrian Crossings |      |       |       |
|------------------------|--------------------------------|------|------|-------|--------------------------------|------|------|-------|-----------------------------------|------|------|-------|-----------------------------------|------|------|-------|-------|-----------------|----------------------|------|-------|-------|
|                        | U-Turn                         | Left | Thru | Right | U-Turn                         | Left | Thru | Right | U-Turn                            | Left | Thru | Right | U-Turn                            | Left | Thru | Right |       |                 | West                 | East | South | North |
| 4:00 PM                | 0                              | 0    | 26   | 0     | 0                              | 1    | 31   | 0     | 0                                 | 2    | 0    | 1     | 0                                 | 0    | 0    | 0     | 61    | 276             | 0                    | 0    | 0     | 0     |
| 4:15 PM                | 0                              | 0    | 23   | 1     | 0                              | 1    | 45   | 0     | 0                                 | 0    | 0    | 0     | 0                                 | 0    | 0    | 0     | 70    | 302             | 0                    | 0    | 0     | 0     |
| 4:30 PM                | 0                              | 0    | 26   | 0     | 0                              | 0    | 46   | 0     | 0                                 | 0    | 0    | 0     | 0                                 | 0    | 0    | 0     | 72    | 302             | 0                    | 0    | 0     | 0     |
| 4:45 PM                | 0                              | 0    | 23   | 0     | 0                              | 1    | 47   | 0     | 0                                 | 1    | 0    | 1     | 0                                 | 0    | 0    | 0     | 73    | 321             | 0                    | 0    | 1     | 0     |
| 5:00 PM                | 0                              | 0    | 38   | 1     | 0                              | 4    | 44   | 0     | 0                                 | 0    | 0    | 0     | 0                                 | 0    | 0    | 0     | 87    | 296             | 0                    | 0    | 2     | 0     |
| 5:15 PM                | 0                              | 0    | 33   | 0     | 0                              | 1    | 35   | 0     | 0                                 | 0    | 0    | 1     | 0                                 | 0    | 0    | 0     | 70    |                 | 0                    | 0    | 0     | 1     |
| 5:30 PM                | 0                              | 0    | 48   | 0     | 0                              | 0    | 42   | 0     | 0                                 | 0    | 0    | 1     | 0                                 | 0    | 0    | 0     | 91    |                 | 0                    | 0    | 0     | 0     |
| 5:45 PM                | 0                              | 0    | 11   | 0     | 0                              | 3    | 31   | 0     | 0                                 | 0    | 0    | 3     | 0                                 | 0    | 0    | 0     | 48    |                 | 0                    | 0    | 0     | 0     |
| Count Total            | 0                              | 0    | 228  | 2     | 0                              | 11   | 321  | 0     | 0                                 | 3    | 0    | 7     | 0                                 | 0    | 0    | 0     | 572   |                 | 0                    | 0    | 3     | 1     |
| Peak Hour              | 0                              | 0    | 142  | 1     | 0                              | 6    | 168  | 0     | 0                                 | 1    | 0    | 3     | 0                                 | 0    | 0    | 0     | 321   |                 | 0                    | 0    | 3     | 1     |

Site Code: 7  
Station ID: 7  
LONDONDERRY DR W.O. LIBERTY GROVE DR

| Start Time  | 02-Apr-24<br>Tue | EB        | WB         |   |   |   |   |   |   | Total |
|-------------|------------------|-----------|------------|---|---|---|---|---|---|-------|
| 12:00 AM    |                  | 3         | 8          |   |   |   |   |   |   | 11    |
| 01:00       |                  | 1         | 3          |   |   |   |   |   |   | 4     |
| 02:00       |                  | 4         | 1          |   |   |   |   |   |   | 5     |
| 03:00       |                  | 7         | 0          |   |   |   |   |   |   | 7     |
| 04:00       |                  | 17        | 2          |   |   |   |   |   |   | 19    |
| 05:00       |                  | 55        | 4          |   |   |   |   |   |   | 59    |
| 06:00       |                  | 110       | 31         |   |   |   |   |   |   | 141   |
| 07:00       |                  | 504       | 307        |   |   |   |   |   |   | 811   |
| 08:00       |                  | 127       | 86         |   |   |   |   |   |   | 213   |
| 09:00       |                  | 72        | 69         |   |   |   |   |   |   | 141   |
| 10:00       |                  | 68        | 57         |   |   |   |   |   |   | 125   |
| 11:00       |                  | 77        | 86         |   |   |   |   |   |   | 163   |
| 12:00 PM    |                  | 66        | 73         |   |   |   |   |   |   | 139   |
| 01:00       |                  | 97        | 95         |   |   |   |   |   |   | 192   |
| 02:00       |                  | 89        | 194        |   |   |   |   |   |   | 283   |
| 03:00       |                  | 279       | 205        |   |   |   |   |   |   | 484   |
| 04:00       |                  | 99        | 172        |   |   |   |   |   |   | 271   |
| 05:00       |                  | 131       | 152        |   |   |   |   |   |   | 283   |
| 06:00       |                  | 75        | 121        |   |   |   |   |   |   | 196   |
| 07:00       |                  | 58        | 87         |   |   |   |   |   |   | 145   |
| 08:00       |                  | 21        | 69         |   |   |   |   |   |   | 90    |
| 09:00       |                  | 27        | 39         |   |   |   |   |   |   | 66    |
| 10:00       |                  | 8         | 23         |   |   |   |   |   |   | 31    |
| 11:00       |                  | 12        | 8          |   |   |   |   |   |   | 20    |
| Total       |                  | 2007      | 1892       |   |   |   |   |   |   | 3899  |
| Percent     |                  | 51.5%     | 48.5%      |   |   |   |   |   |   |       |
| AM Peak     | -                | 07:00     | 07:00      | - | - | - | - | - | - | 07:00 |
| Vol.        | -                | 504       | 307        | - | - | - | - | - | - | 811   |
| PM Peak     | -                | 15:00     | 15:00      | - | - | - | - | - | - | 15:00 |
| Vol.        | -                | 279       | 205        | - | - | - | - | - | - | 484   |
| Grand Total |                  | 2007      | 1892       |   |   |   |   |   |   | 3899  |
| Percent     |                  | 51.5%     | 48.5%      |   |   |   |   |   |   |       |
| ADT         |                  | ADT 3,899 | AADT 3,899 |   |   |   |   |   |   |       |

Site Code: 8  
Station ID: 8  
MERIDIAN RD N.O. LONDONDERRY DR

| Start Time  | 02-Apr-24<br>Tue | NB         | SB          |   |   |   |   |   |   | Total |
|-------------|------------------|------------|-------------|---|---|---|---|---|---|-------|
| 12:00 AM    |                  | 12         | 7           |   |   |   |   |   |   | 19    |
| 01:00       |                  | 11         | 14          |   |   |   |   |   |   | 25    |
| 02:00       |                  | 6          | 8           |   |   |   |   |   |   | 14    |
| 03:00       |                  | 8          | 13          |   |   |   |   |   |   | 21    |
| 04:00       |                  | 20         | 25          |   |   |   |   |   |   | 45    |
| 05:00       |                  | 62         | 112         |   |   |   |   |   |   | 174   |
| 06:00       |                  | 263        | 283         |   |   |   |   |   |   | 546   |
| 07:00       |                  | 599        | 538         |   |   |   |   |   |   | 1137  |
| 08:00       |                  | 352        | 320         |   |   |   |   |   |   | 672   |
| 09:00       |                  | 253        | 281         |   |   |   |   |   |   | 534   |
| 10:00       |                  | 230        | 298         |   |   |   |   |   |   | 528   |
| 11:00       |                  | 275        | 306         |   |   |   |   |   |   | 581   |
| 12:00 PM    |                  | 311        | 304         |   |   |   |   |   |   | 615   |
| 01:00       |                  | 297        | 254         |   |   |   |   |   |   | 551   |
| 02:00       |                  | 344        | 330         |   |   |   |   |   |   | 674   |
| 03:00       |                  | 530        | 538         |   |   |   |   |   |   | 1068  |
| 04:00       |                  | 514        | 489         |   |   |   |   |   |   | 1003  |
| 05:00       |                  | 558        | 485         |   |   |   |   |   |   | 1043  |
| 06:00       |                  | 368        | 309         |   |   |   |   |   |   | 677   |
| 07:00       |                  | 263        | 225         |   |   |   |   |   |   | 488   |
| 08:00       |                  | 203        | 165         |   |   |   |   |   |   | 368   |
| 09:00       |                  | 94         | 72          |   |   |   |   |   |   | 166   |
| 10:00       |                  | 37         | 33          |   |   |   |   |   |   | 70    |
| 11:00       |                  | 22         | 12          |   |   |   |   |   |   | 34    |
| Total       |                  | 5632       | 5421        |   |   |   |   |   |   | 11053 |
| Percent     |                  | 51.0%      | 49.0%       |   |   |   |   |   |   |       |
| AM Peak     | -                | 07:00      | 07:00       | - | - | - | - | - | - | 07:00 |
| Vol.        | -                | 599        | 538         | - | - | - | - | - | - | 1137  |
| PM Peak     | -                | 17:00      | 15:00       | - | - | - | - | - | - | 15:00 |
| Vol.        | -                | 558        | 538         | - | - | - | - | - | - | 1068  |
| Grand Total |                  | 5632       | 5421        |   |   |   |   |   |   | 11053 |
| Percent     |                  | 51.0%      | 49.0%       |   |   |   |   |   |   |       |
| ADT         |                  | ADT 11,053 | AADT 11,053 |   |   |   |   |   |   |       |

Site Code: 9  
Station ID: 9  
LONDONDERRY RD E.O. MERIDIAN RD

| Start Time  | 02-Apr-24<br>Tue | EB        | WB         |   |   |   |   |   |   | Total |
|-------------|------------------|-----------|------------|---|---|---|---|---|---|-------|
| 12:00 AM    |                  | 13        | 6          |   |   |   |   |   |   | 19    |
| 01:00       |                  | 11        | 4          |   |   |   |   |   |   | 15    |
| 02:00       |                  | 6         | 3          |   |   |   |   |   |   | 9     |
| 03:00       |                  | 0         | 18         |   |   |   |   |   |   | 18    |
| 04:00       |                  | 5         | 43         |   |   |   |   |   |   | 48    |
| 05:00       |                  | 13        | 121        |   |   |   |   |   |   | 134   |
| 06:00       |                  | 58        | 369        |   |   |   |   |   |   | 427   |
| 07:00       |                  | 310       | 742        |   |   |   |   |   |   | 1052  |
| 08:00       |                  | 198       | 408        |   |   |   |   |   |   | 606   |
| 09:00       |                  | 153       | 242        |   |   |   |   |   |   | 395   |
| 10:00       |                  | 163       | 224        |   |   |   |   |   |   | 387   |
| 11:00       |                  | 218       | 226        |   |   |   |   |   |   | 444   |
| 12:00 PM    |                  | 215       | 258        |   |   |   |   |   |   | 473   |
| 01:00       |                  | 239       | 241        |   |   |   |   |   |   | 480   |
| 02:00       |                  | 274       | 346        |   |   |   |   |   |   | 620   |
| 03:00       |                  | 539       | 332        |   |   |   |   |   |   | 871   |
| 04:00       |                  | 477       | 359        |   |   |   |   |   |   | 836   |
| 05:00       |                  | 525       | 346        |   |   |   |   |   |   | 871   |
| 06:00       |                  | 384       | 239        |   |   |   |   |   |   | 623   |
| 07:00       |                  | 291       | 161        |   |   |   |   |   |   | 452   |
| 08:00       |                  | 248       | 96         |   |   |   |   |   |   | 344   |
| 09:00       |                  | 154       | 49         |   |   |   |   |   |   | 203   |
| 10:00       |                  | 74        | 29         |   |   |   |   |   |   | 103   |
| 11:00       |                  | 35        | 12         |   |   |   |   |   |   | 47    |
| Total       |                  | 4603      | 4874       |   |   |   |   |   |   | 9477  |
| Percent     |                  | 48.6%     | 51.4%      |   |   |   |   |   |   |       |
| AM Peak     | -                | 07:00     | 07:00      | - | - | - | - | - | - | 07:00 |
| Vol.        | -                | 310       | 742        | - | - | - | - | - | - | 1052  |
| PM Peak     | -                | 15:00     | 16:00      | - | - | - | - | - | - | 15:00 |
| Vol.        | -                | 539       | 359        | - | - | - | - | - | - | 871   |
| Grand Total |                  | 4603      | 4874       |   |   |   |   |   |   | 9477  |
| Percent     |                  | 48.6%     | 51.4%      |   |   |   |   |   |   |       |
| ADT         |                  | ADT 9,477 | AADT 9,477 |   |   |   |   |   |   |       |

**All Traffic Data Services**  
 9660 W 44th Ave  
 Wheat Ridge, CO 80033  
[www.alltrafficdata.net](http://www.alltrafficdata.net)

Site Code: 10  
 Station ID: 10  
 STAPLETON DR E.O. MERIDIAN RD

| Start Time  | 02-Apr-24<br>Tue | EB         | WB          |   |   |   |   |   |   | Total |
|-------------|------------------|------------|-------------|---|---|---|---|---|---|-------|
| 12:00 AM    |                  | 19         | 9           |   |   |   |   |   |   | 28    |
| 01:00       |                  | 9          | 2           |   |   |   |   |   |   | 11    |
| 02:00       |                  | 7          | 7           |   |   |   |   |   |   | 14    |
| 03:00       |                  | 5          | 11          |   |   |   |   |   |   | 16    |
| 04:00       |                  | 13         | 49          |   |   |   |   |   |   | 62    |
| 05:00       |                  | 58         | 113         |   |   |   |   |   |   | 171   |
| 06:00       |                  | 132        | 344         |   |   |   |   |   |   | 476   |
| 07:00       |                  | 325        | 650         |   |   |   |   |   |   | 975   |
| 08:00       |                  | 260        | 349         |   |   |   |   |   |   | 609   |
| 09:00       |                  | 178        | 285         |   |   |   |   |   |   | 463   |
| 10:00       |                  | 190        | 263         |   |   |   |   |   |   | 453   |
| 11:00       |                  | 236        | 261         |   |   |   |   |   |   | 497   |
| 12:00 PM    |                  | 271        | 306         |   |   |   |   |   |   | 577   |
| 01:00       |                  | 230        | 269         |   |   |   |   |   |   | 499   |
| 02:00       |                  | 335        | 381         |   |   |   |   |   |   | 716   |
| 03:00       |                  | 469        | 371         |   |   |   |   |   |   | 840   |
| 04:00       |                  | 455        | 389         |   |   |   |   |   |   | 844   |
| 05:00       |                  | 496        | 386         |   |   |   |   |   |   | 882   |
| 06:00       |                  | 440        | 296         |   |   |   |   |   |   | 736   |
| 07:00       |                  | 295        | 187         |   |   |   |   |   |   | 482   |
| 08:00       |                  | 220        | 151         |   |   |   |   |   |   | 371   |
| 09:00       |                  | 158        | 71          |   |   |   |   |   |   | 229   |
| 10:00       |                  | 87         | 38          |   |   |   |   |   |   | 125   |
| 11:00       |                  | 28         | 15          |   |   |   |   |   |   | 43    |
| Total       |                  | 4916       | 5203        |   |   |   |   |   |   | 10119 |
| Percent     |                  | 48.6%      | 51.4%       |   |   |   |   |   |   |       |
| AM Peak     | -                | 07:00      | 07:00       | - | - | - | - | - | - | 07:00 |
| Vol.        | -                | 325        | 650         | - | - | - | - | - | - | 975   |
| PM Peak     | -                | 17:00      | 16:00       | - | - | - | - | - | - | 17:00 |
| Vol.        | -                | 496        | 389         | - | - | - | - | - | - | 882   |
| Grand Total |                  | 4916       | 5203        |   |   |   |   |   |   | 10119 |
| Percent     |                  | 48.6%      | 51.4%       |   |   |   |   |   |   |       |
| ADT         |                  | ADT 10,119 | AADT 10,119 |   |   |   |   |   |   |       |

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Site Code: 11  
Station ID: 11  
MERIDIAN RD S.O. STAPLETON DR

| Start Time  | 02-Apr-24<br>Tue | NB         | SB          |   |   |   |   |   |   | Total |
|-------------|------------------|------------|-------------|---|---|---|---|---|---|-------|
| 12:00 AM    |                  | 52         | 16          |   |   |   |   |   |   | 68    |
| 01:00       |                  | 24         | 12          |   |   |   |   |   |   | 36    |
| 02:00       |                  | 18         | 22          |   |   |   |   |   |   | 40    |
| 03:00       |                  | 14         | 45          |   |   |   |   |   |   | 59    |
| 04:00       |                  | 22         | 150         |   |   |   |   |   |   | 172   |
| 05:00       |                  | 54         | 365         |   |   |   |   |   |   | 419   |
| 06:00       |                  | 220        | 1083        |   |   |   |   |   |   | 1303  |
| 07:00       |                  | 644        | 1582        |   |   |   |   |   |   | 2226  |
| 08:00       |                  | 626        | 1036        |   |   |   |   |   |   | 1662  |
| 09:00       |                  | 465        | 798         |   |   |   |   |   |   | 1263  |
| 10:00       |                  | 501        | 713         |   |   |   |   |   |   | 1214  |
| 11:00       |                  | 682        | 712         |   |   |   |   |   |   | 1394  |
| 12:00 PM    |                  | 789        | 774         |   |   |   |   |   |   | 1563  |
| 01:00       |                  | 791        | 729         |   |   |   |   |   |   | 1520  |
| 02:00       |                  | 928        | 808         |   |   |   |   |   |   | 1736  |
| 03:00       |                  | 1186       | 1058        |   |   |   |   |   |   | 2244  |
| 04:00       |                  | 1409       | 936         |   |   |   |   |   |   | 2345  |
| 05:00       |                  | 1495       | 966         |   |   |   |   |   |   | 2461  |
| 06:00       |                  | 1092       | 668         |   |   |   |   |   |   | 1760  |
| 07:00       |                  | 896        | 457         |   |   |   |   |   |   | 1353  |
| 08:00       |                  | 636        | 303         |   |   |   |   |   |   | 939   |
| 09:00       |                  | 439        | 179         |   |   |   |   |   |   | 618   |
| 10:00       |                  | 240        | 90          |   |   |   |   |   |   | 330   |
| 11:00       |                  | 95         | 43          |   |   |   |   |   |   | 138   |
| Total       |                  | 13318      | 13545       |   |   |   |   |   |   | 26863 |
| Percent     |                  | 49.6%      | 50.4%       |   |   |   |   |   |   |       |
| AM Peak     | -                | 11:00      | 07:00       | - | - | - | - | - | - | 07:00 |
| Vol.        | -                | 682        | 1582        | - | - | - | - | - | - | 2226  |
| PM Peak     | -                | 17:00      | 15:00       | - | - | - | - | - | - | 17:00 |
| Vol.        | -                | 1495       | 1058        | - | - | - | - | - | - | 2461  |
| Grand Total |                  | 13318      | 13545       |   |   |   |   |   |   | 26863 |
| Percent     |                  | 49.6%      | 50.4%       |   |   |   |   |   |   |       |
| ADT         |                  | ADT 26,863 | AADT 26,863 |   |   |   |   |   |   |       |

Site Code: 12  
Station ID: 12  
STAPLETON DR W.O. LIBERTY GROVE DR

| Start Time  | 02-Apr-24<br>Tue | EB        | WB         |   |   |   |   |   |   | Total |
|-------------|------------------|-----------|------------|---|---|---|---|---|---|-------|
| 12:00 AM    |                  | 5         | 7          |   |   |   |   |   |   | 12    |
| 01:00       |                  | 3         | 2          |   |   |   |   |   |   | 5     |
| 02:00       |                  | 1         | 0          |   |   |   |   |   |   | 1     |
| 03:00       |                  | 4         | 1          |   |   |   |   |   |   | 5     |
| 04:00       |                  | 19        | 4          |   |   |   |   |   |   | 23    |
| 05:00       |                  | 50        | 8          |   |   |   |   |   |   | 58    |
| 06:00       |                  | 151       | 53         |   |   |   |   |   |   | 204   |
| 07:00       |                  | 293       | 311        |   |   |   |   |   |   | 604   |
| 08:00       |                  | 116       | 80         |   |   |   |   |   |   | 196   |
| 09:00       |                  | 105       | 62         |   |   |   |   |   |   | 167   |
| 10:00       |                  | 95        | 86         |   |   |   |   |   |   | 181   |
| 11:00       |                  | 95        | 95         |   |   |   |   |   |   | 190   |
| 12:00 PM    |                  | 112       | 119        |   |   |   |   |   |   | 231   |
| 01:00       |                  | 92        | 88         |   |   |   |   |   |   | 180   |
| 02:00       |                  | 96        | 233        |   |   |   |   |   |   | 329   |
| 03:00       |                  | 321       | 265        |   |   |   |   |   |   | 586   |
| 04:00       |                  | 142       | 207        |   |   |   |   |   |   | 349   |
| 05:00       |                  | 146       | 215        |   |   |   |   |   |   | 361   |
| 06:00       |                  | 91        | 147        |   |   |   |   |   |   | 238   |
| 07:00       |                  | 76        | 113        |   |   |   |   |   |   | 189   |
| 08:00       |                  | 35        | 80         |   |   |   |   |   |   | 115   |
| 09:00       |                  | 16        | 38         |   |   |   |   |   |   | 54    |
| 10:00       |                  | 8         | 33         |   |   |   |   |   |   | 41    |
| 11:00       |                  | 4         | 22         |   |   |   |   |   |   | 26    |
| Total       |                  | 2076      | 2269       |   |   |   |   |   |   | 4345  |
| Percent     |                  | 47.8%     | 52.2%      |   |   |   |   |   |   |       |
| AM Peak     | -                | 07:00     | 07:00      | - | - | - | - | - | - | 07:00 |
| Vol.        | -                | 293       | 311        | - | - | - | - | - | - | 604   |
| PM Peak     | -                | 15:00     | 15:00      | - | - | - | - | - | - | 15:00 |
| Vol.        | -                | 321       | 265        | - | - | - | - | - | - | 586   |
| Grand Total |                  | 2076      | 2269       |   |   |   |   |   |   | 4345  |
| Percent     |                  | 47.8%     | 52.2%      |   |   |   |   |   |   |       |
| ADT         |                  | ADT 4,345 | AADT 4,345 |   |   |   |   |   |   |       |

## **Appendix B – Existing Conditions Analyses**

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 60.2  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | E     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.725 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 157         | 346    | 141    | 110         | 980    | 9      | 15           | 75     | 252    | 350          | 145    | 155    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 71     | 0           | 0      | 5      | 0            | 0      | 126    | 0            | 0      | 78     |
| Total Hourly Volume [veh/h]                 | 157         | 346    | 70     | 110         | 980    | 4      | 15           | 75     | 126    | 350          | 145    | 77     |
| Peak Hour Factor                            | 0.9100      | 0.9100 | 0.9100 | 0.9400      | 0.9400 | 0.9400 | 0.8300       | 0.8300 | 0.8300 | 0.8000       | 0.8000 | 0.8000 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 43          | 95     | 19     | 29          | 261    | 1      | 5            | 23     | 38     | 109          | 45     | 24     |
| Total Analysis Volume [veh/h]               | 173         | 380    | 77     | 117         | 1043   | 4      | 18           | 90     | 152    | 438          | 181    | 96     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 90                                    |
| Active Pattern            | Free Running (No Pattern)             |
| Coordination Type         | <i>Free Running</i>                   |
| Actuation Type            | <i>Fully actuated</i>                 |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal Group                    | 1       | 6       | 0       | 5       | 2       | 0       | 0       | 8       | 0       | 0       | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]               | 20      | 70      | 0       | 20      | 70      | 0       | 0       | 40      | 0       | 0       | 40      | 0       |
| Amber [s]                       | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                     | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                        | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       |
| Pedestrian Clearance [s]        | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0       | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0     | 5.5     | 0.0     | 5.0     | 5.5     | 0.0     | 0.0     | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Phasing & Timing: Free Running (No Pattern)**

|                       |      |     |     |      |     |     |     |     |     |     |     |     |
|-----------------------|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|
| Split [s]             | 9    | 40  | 0   | 9    | 40  | 0   | 0   | 30  | 0   | 0   | 30  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | -   | -   | -   | -   | -   | -   |
| Minimum Green [s]     | 5    | 20  | 0   | 5    | 20  | 0   | 0   | 10  | 0   | 0   | 10  | 0   |
| Vehicle Extension [s] | 2.0  | 2.0 | 0.0 | 2.0  | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     |     | No  |     |     | No  |     |
| Maximum Recall        | No   | Yes |     | No   | Yes |     |     | No  |     |     | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     |     | No  |     |     | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L      | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| C, Calculated Cycle Length [s]          | 140   | 140   | 140   | 140   | 140   | 140   | 140   | 140   | 140   | 140    | 140   | 140   |
| L, Total Lost Time per Cycle [s]        | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.00  | 7.00  | 7.00  | 7.00   | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 2.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 5.50  | 5.50  | 0.00  | 5.50  | 5.50  | 5.00  | 5.00  | 5.00  | 5.00   | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 85    | 72    | 72    | 85    | 70    | 70    | 40    | 40    | 40    | 40     | 40    | 40    |
| g / C, Green / Cycle                    | 0.61  | 0.52  | 0.52  | 0.61  | 0.50  | 0.50  | 0.29  | 0.29  | 0.29  | 0.29   | 0.29  | 0.29  |
| (v / s)_i Volume / Saturation Flow Rate | 0.24  | 0.11  | 0.05  | 0.11  | 0.29  | 0.00  | 0.02  | 0.05  | 0.10  | 0.38   | 0.10  | 0.06  |
| s, saturation flow rate [veh/h]         | 730   | 3560  | 1589  | 1043  | 3560  | 1589  | 1102  | 1870  | 1589  | 1138   | 1870  | 1589  |
| c, Capacity [veh/h]                     | 409   | 1840  | 821   | 658   | 1786  | 797   | 267   | 536   | 456   | 320    | 536   | 456   |
| d1, Uniform Delay [s]                   | 16.25 | 18.25 | 17.13 | 11.67 | 24.52 | 17.38 | 45.94 | 37.31 | 39.27 | 55.97  | 39.32 | 37.80 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.04  | 0.04  | 0.04  | 0.50   | 0.04  | 0.04  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 3.18  | 0.25  | 0.23  | 0.59  | 1.40  | 0.01  | 0.04  | 0.05  | 0.16  | 184.58 | 0.14  | 0.08  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |       |       |        |        |         |        |        |
|---------------------------------------|--------|--------|-------|-------|--------|-------|-------|--------|--------|---------|--------|--------|
| X, volume / capacity                  | 0.42   | 0.21   | 0.09  | 0.18  | 0.58   | 0.01  | 0.07  | 0.17   | 0.33   | 1.37    | 0.34   | 0.21   |
| d, Delay for Lane Group [s/veh]       | 19.43  | 18.50  | 17.36 | 12.26 | 25.92  | 17.39 | 45.97 | 37.36  | 39.43  | 240.55  | 39.46  | 37.88  |
| Lane Group LOS                        | B      | B      | B     | B     | C      | B     | D     | D      | D      | F       | D      | D      |
| Critical Lane Group                   | Yes    | No     | No    | No    | Yes    | No    | No    | No     | No     | Yes     | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 2.49   | 3.19   | 1.24  | 1.50  | 11.63  | 0.06  | 0.51  | 2.28   | 4.07   | 27.67   | 4.85   | 2.47   |
| 50th-Percentile Queue Length [ft/ln]  | 62.29  | 79.80  | 31.03 | 37.51 | 290.64 | 1.60  | 12.71 | 57.12  | 101.68 | 691.83  | 121.14 | 61.77  |
| 95th-Percentile Queue Length [veh/ln] | 4.49   | 5.75   | 2.23  | 2.70  | 17.22  | 0.11  | 0.91  | 4.11   | 7.32   | 42.76   | 8.46   | 4.45   |
| 95th-Percentile Queue Length [ft/ln]  | 112.13 | 143.64 | 55.86 | 67.51 | 430.43 | 2.87  | 22.87 | 102.81 | 183.02 | 1068.90 | 211.40 | 111.19 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 19.43 | 18.50 | 17.36 | 12.26 | 25.92 | 17.39 | 45.97 | 37.36 | 39.43 | 240.55 | 39.46 | 37.88 |
| Movement LOS                    | B     | B     | B     | B     | C     | B     | D     | D     | D     | F      | D     | D     |
| d_A, Approach Delay [s/veh]     | 18.62 |       |       | 24.52 |       |       | 39.17 |       |       | 162.43 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | D     |       |       | F      |       |       |
| d_I, Intersection Delay [s/veh] | 60.16 |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | E     |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.725 |       |       |       |       |       |       |       |       |        |       |       |

**Emissions**

|                              |        |        |        |       |         |      |       |        |        |         |        |        |
|------------------------------|--------|--------|--------|-------|---------|------|-------|--------|--------|---------|--------|--------|
| Vehicle Miles Traveled [mph] | 70.73  | 155.35 | 31.48  | 11.42 | 101.82  | 0.39 | 1.77  | 8.85   | 14.95  | 91.46   | 37.79  | 20.05  |
| Stops [stops/h]              | 64.29  | 164.73 | 32.03  | 38.71 | 599.95  | 1.65 | 13.12 | 58.95  | 104.94 | 714.06  | 125.04 | 63.76  |
| Fuel consumption [US gal/h]  | 4.24   | 9.69   | 1.92   | 1.39  | 20.05   | 0.06 | 0.39  | 1.72   | 3.04   | 33.45   | 4.30   | 2.22   |
| CO [g/h]                     | 296.66 | 677.15 | 134.21 | 97.37 | 1401.64 | 4.04 | 27.41 | 120.28 | 212.28 | 2338.13 | 300.81 | 155.17 |
| NOx [g/h]                    | 57.72  | 131.75 | 26.11  | 18.94 | 272.71  | 0.79 | 5.33  | 23.40  | 41.30  | 454.91  | 58.53  | 30.19  |
| VOC [g/h]                    | 68.75  | 156.94 | 31.10  | 22.57 | 324.84  | 0.94 | 6.35  | 27.88  | 49.20  | 541.88  | 69.71  | 35.96  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | F     |  |  | F     |  |  | F     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1003  |  |  | 1003  |  |  | 573   |  |  | 573   |  |  |
| d_b, Bicycle Delay [s]                                   | 17.32 |  |  | 17.32 |  |  | 35.49 |  |  | 35.49 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.138 |  |  | 2.524 |  |  | 2.197 |  |  | 2.868 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 52.8  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.607 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 98          | 328    | 109    | 70          | 411    | 57     | 102            | 131    | 263    | 397            | 176    | 169    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 55     | 0           | 0      | 29     | 0              | 0      | 132    | 0              | 0      | 85     |
| Total Hourly Volume [veh/h]                 | 98          | 328    | 54     | 70          | 411    | 28     | 102            | 131    | 131    | 397            | 176    | 84     |
| Peak Hour Factor                            | 0.8200      | 0.8200 | 0.8200 | 0.7800      | 0.7800 | 0.7800 | 0.7500         | 0.7500 | 0.7500 | 0.8400         | 0.8400 | 0.8400 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 30          | 100    | 16     | 22          | 132    | 9      | 34             | 44     | 44     | 118            | 52     | 25     |
| Total Analysis Volume [veh/h]               | 120         | 400    | 66     | 90          | 527    | 36     | 136            | 175    | 175    | 473            | 210    | 100    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 90                                    |
| Active Pattern            | Free Running (No Pattern)             |
| Coordination Type         | <i>Free Running</i>                   |
| Actuation Type            | <i>Fully actuated</i>                 |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal Group                    | 0       | 6       | 0       | 0       | 2       | 0       | 0       | 8       | 0       | 0       | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]               | 0       | 60      | 0       | 0       | 60      | 0       | 0       | 45      | 0       | 0       | 45      | 0       |
| Amber [s]                       | 0.0     | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                     | 0.0     | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| Walk [s]                        | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       |
| Pedestrian Clearance [s]        | 0       | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0       | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]      | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 0.0     | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Phasing & Timing: Free Running (No Pattern)**

|                       |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Split [s]             | 0   | 37  | 0   | 0   | 37  | 0   | 0   | 53  | 0   | 0   | 53  | 0   |
| Lead / Lag            | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| Minimum Green [s]     | 0   | 25  | 0   | 0   | 25  | 0   | 0   | 8   | 0   | 0   | 8   | 0   |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Minimum Recall        |     | No  |     |     | No  |     |     | No  |     |     | No  |     |
| Maximum Recall        |     | Yes |     |     | Yes |     |     | No  |     |     | No  |     |
| Pedestrian Recall     |     | No  |     |     | No  |     |     | No  |     |     | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L      | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| C, Calculated Cycle Length [s]          | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118   | 118    | 118   | 118   |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 6.00   | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 2.00   | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 4.00  | 4.00  | 4.00  | 4.00   | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 60    | 60    | 60    | 60    | 60    | 60    | 45    | 45    | 45    | 45     | 45    | 45    |
| g / C, Green / Cycle                    | 0.51  | 0.51  | 0.51  | 0.51  | 0.51  | 0.51  | 0.38  | 0.38  | 0.38  | 0.38   | 0.38  | 0.38  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.11  | 0.04  | 0.10  | 0.15  | 0.02  | 0.13  | 0.09  | 0.11  | 0.46   | 0.11  | 0.06  |
| s, saturation flow rate [veh/h]         | 847   | 3560  | 1589  | 927   | 3560  | 1589  | 1069  | 1870  | 1589  | 1031   | 1870  | 1589  |
| c, Capacity [veh/h]                     | 406   | 1810  | 808   | 459   | 1810  | 808   | 367   | 713   | 606   | 371    | 713   | 606   |
| d1, Uniform Delay [s]                   | 24.19 | 16.06 | 14.87 | 21.25 | 16.73 | 14.58 | 34.45 | 24.91 | 25.37 | 44.19  | 25.44 | 24.10 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.50   | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 1.85  | 0.28  | 0.20  | 0.95  | 0.41  | 0.10  | 0.62  | 0.18  | 0.26  | 143.47 | 0.23  | 0.13  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00   | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |       |        |        |        |        |        |       |
|---------------------------------------|--------|--------|-------|-------|--------|-------|--------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.30   | 0.22   | 0.08  | 0.20  | 0.29   | 0.04  | 0.37   | 0.25   | 0.29   | 1.28   | 0.29   | 0.16  |
| d, Delay for Lane Group [s/veh]       | 26.05  | 16.34  | 15.07 | 22.20 | 17.14  | 14.69 | 35.07  | 25.09  | 25.63  | 187.65 | 25.66  | 24.22 |
| Lane Group LOS                        | C      | B      | B     | C     | B      | B     | D      | C      | C      | F      | C      | C     |
| Critical Lane Group                   | No     | No     | No    | No    | Yes    | No    | No     | No     | No     | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.37   | 2.79   | 0.88  | 1.58  | 3.84   | 0.47  | 3.22   | 3.35   | 3.42   | 25.78  | 4.11   | 1.85  |
| 50th-Percentile Queue Length [ft/ln]  | 59.14  | 69.87  | 21.92 | 39.60 | 96.05  | 11.72 | 80.62  | 83.74  | 85.49  | 644.42 | 102.66 | 46.33 |
| 95th-Percentile Queue Length [veh/ln] | 4.26   | 5.03   | 1.58  | 2.85  | 6.92   | 0.84  | 5.80   | 6.03   | 6.16   | 39.47  | 7.39   | 3.34  |
| 95th-Percentile Queue Length [ft/ln]  | 106.44 | 125.77 | 39.46 | 71.28 | 172.88 | 21.09 | 145.11 | 150.73 | 153.89 | 986.82 | 184.78 | 83.40 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| d_M, Delay for Movement [s/veh] | 26.05 | 16.34 | 15.07 | 22.20 | 17.14 | 14.69 | 35.07 | 25.09 | 25.63 | 187.65 | 25.66 | 24.22 |
| Movement LOS                    | C     | B     | B     | C     | B     | B     | D     | C     | C     | F      | C     | C     |
| d_A, Approach Delay [s/veh]     | 18.18 |       |       | 17.70 |       |       | 28.08 |       |       | 123.33 |       |       |
| Approach LOS                    | B     |       |       | B     |       |       | C     |       |       | F      |       |       |
| d_I, Intersection Delay [s/veh] | 52.80 |       |       |       |       |       |       |       |       |        |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |        |       |       |
| Intersection V/C                | 0.607 |       |       |       |       |       |       |       |       |        |       |       |

**Emissions**

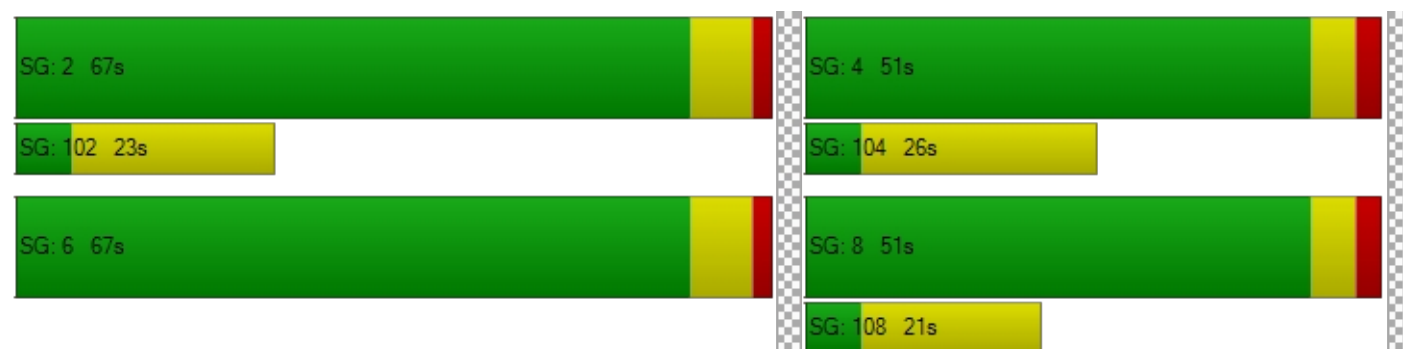
|                              |        |        |       |        |        |       |        |        |        |         |        |        |
|------------------------------|--------|--------|-------|--------|--------|-------|--------|--------|--------|---------|--------|--------|
| Vehicle Miles Traveled [mph] | 39.44  | 131.48 | 21.69 | 22.33  | 130.77 | 8.93  | 44.59  | 57.38  | 57.38  | 72.14   | 32.03  | 15.25  |
| Stops [stops/h]              | 72.17  | 170.54 | 26.76 | 48.33  | 234.41 | 14.30 | 98.38  | 102.19 | 104.33 | 786.42  | 125.27 | 56.54  |
| Fuel consumption [US gal/h]  | 3.30   | 8.90   | 1.43  | 2.05   | 10.57  | 0.67  | 3.41   | 3.85   | 3.88   | 26.72   | 3.26   | 1.50   |
| CO [g/h]                     | 230.38 | 621.82 | 99.61 | 143.39 | 738.60 | 46.97 | 238.37 | 269.05 | 271.53 | 1867.95 | 227.85 | 104.81 |
| NOx [g/h]                    | 44.82  | 120.98 | 19.38 | 27.90  | 143.71 | 9.14  | 46.38  | 52.35  | 52.83  | 363.43  | 44.33  | 20.39  |
| VOC [g/h]                    | 53.39  | 144.11 | 23.09 | 33.23  | 171.18 | 10.89 | 55.24  | 62.36  | 62.93  | 432.91  | 52.81  | 24.29  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 50.34 |  |  | 50.34 |  |  | 50.34 |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.799 |  |  | 3.120 |  |  | 2.792 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | D     |  |  | C     |  |  | C     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1017  |  |  | 1017  |  |  | 763   |  |  | 763   |  |  |
| d_b, Bicycle Delay [s]                                   | 14.25 |  |  | 14.25 |  |  | 22.58 |  |  | 22.58 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.088 |  |  | 2.122 |  |  | 2.579 |  |  | 2.992 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 23.2  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.066 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 7                | 6      | 489            | 15     | 4              | 300    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0              | 0      | 0              | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 7                | 6      | 489            | 15     | 4              | 300    |
| Peak Hour Factor                        | 0.5000           | 0.5000 | 0.7100         | 0.7100 | 0.6600         | 0.6600 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4                | 3      | 172            | 5      | 2              | 114    |
| Total Analysis Volume [veh/h]           | 14               | 12     | 689            | 21     | 6              | 455    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.07  | 0.03  | 0.01 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 23.24 | 14.51 | 0.00 | 0.00 | 9.08 | 0.00 |
| Movement LOS                          | C     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.31  | 0.31  | 0.00 | 0.00 | 0.02 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 7.63  | 7.63  | 0.00 | 0.00 | 0.51 | 0.00 |
| d_A, Approach Delay [s/veh]           | 19.21 |       | 0.00 |      | 0.12 |      |
| Approach LOS                          | C     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.46  |       |      |      |      |      |
| Intersection LOS                      | C     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 16.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.140 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Stapleton Dr                                                                        |        | Stapleton Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Southbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Left                                                                                | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 1      |
| Entry Pocket Length [ft]     | 285.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 115.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 45.00                                                                               |        | 45.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|-----------------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 35               | 17     | 0            | 293    | 294          | 13     |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00         | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| In-Process Volume [veh/h]               | 0                | 0      | 0            | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0            | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0            | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0            | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0            | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0            | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 35               | 17     | 0            | 293    | 294          | 13     |
| Peak Hour Factor                        | 0.7200           | 0.7200 | 0.7800       | 0.7800 | 0.6800       | 0.6800 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 12               | 6      | 0            | 94     | 108          | 5      |
| Total Analysis Volume [veh/h]           | 49               | 24     | 0            | 376    | 432          | 19     |
| Pedestrian Volume [ped/h]               | 0                |        | 0            |        | 0            |        |

**Intersection Settings**

| Priority Scheme                    | Stop | Free | Free |
|------------------------------------|------|------|------|
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.14  | 0.04  | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 16.94 | 11.00 | 8.24 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          | C     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.48  | 0.12  | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 12.04 | 3.00  | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 14.99 |       | 0.00 |      | 0.00 |      |
| Approach LOS                          | B     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.22  |       |      |      |      |      |
| Intersection LOS                      | C     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 8.6   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.008 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Southbound                                                                          |        | Waterbury Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 30.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Southbound |        | Waterbury Dr |        |
|-----------------------------------------|------------------|--------|------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 7                | 13     | 41         | 0      | 0            | 7      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00       | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| In-Process Volume [veh/h]               | 0                | 0      | 0          | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0          | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0          | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0          | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0          | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0          | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 7                | 13     | 41         | 0      | 0            | 7      |
| Peak Hour Factor                        | 0.6000           | 0.6000 | 0.6400     | 0.6400 | 0.8300       | 0.8300 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3                | 5      | 16         | 0      | 0            | 2      |
| Total Analysis Volume [veh/h]           | 12               | 22     | 64         | 0      | 0            | 8      |
| Pedestrian Volume [ped/h]               | 0                |        | 0          |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.35 | 0.00 | 0.00 | 0.00 | 9.12 | 8.63 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.00 | 0.00 | 0.02 | 0.02 |
| 95th-Percentile Queue Length [ft/ln]  | 0.50 | 0.50 | 0.00 | 0.00 | 0.60 | 0.60 |
| d_A, Approach Delay [s/veh]           | 2.60 |      | 0.00 |      | 8.63 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.48 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.0   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.002 |

#### Intersection Setup

| Name                         |                                                                                   |        | Liberty Grove Dr                                                                    |        | Salem Ct                                                                            |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 25.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    |        |        | Liberty Grove Dr |        | Salem Ct |        |
|-----------------------------------------|--------|--------|------------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 3      | 10     | 34               | 1      | 1        | 6      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00             | 2.00   | 2.00     | 2.00   |
| Growth Factor                           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| In-Process Volume [veh/h]               | 0      | 0      | 0                | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0                | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0                | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0                | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0                | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0                | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 3      | 10     | 34               | 1      | 1        | 6      |
| Peak Hour Factor                        | 0.4800 | 0.4800 | 0.6700           | 0.6700 | 0.5800   | 0.5800 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2      | 5      | 13               | 0      | 0        | 3      |
| Total Analysis Volume [veh/h]           | 6      | 21     | 51               | 1      | 2        | 10     |
| Pedestrian Volume [ped/h]               | 0      |        | 0                |        | 0        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.32 | 0.00 | 0.00 | 0.00 | 8.99 | 8.59 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.01 | 0.01 | 0.00 | 0.00 | 0.04 | 0.04 |
| 95th-Percentile Queue Length [ft/ln]  | 0.25 | 0.25 | 0.00 | 0.00 | 0.91 | 0.91 |
| d_A, Approach Delay [s/veh]           | 1.63 |      | 0.00 |      | 8.65 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.62 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 304           | 504 | 13            |
| 2    | 295           | 489 | 13            |
| 3    | 289           | 479 | 12            |
| 4    | 271           | 449 | 12            |
| 5    | 240           | 398 | 10            |
| 6    | 237           | 393 | 10            |
| 7    | 234           | 388 | 10            |
| 8    | 213           | 353 | 9             |
| 9    | 210           | 348 | 9             |
| 10   | 207           | 343 | 9             |
| 11   | 179           | 297 | 8             |
| 12   | 167           | 277 | 7             |
| 13   | 164           | 272 | 7             |
| 14   | 122           | 202 | 5             |
| 15   | 122           | 202 | 5             |
| 16   | 85            | 141 | 4             |
| 17   | 49            | 81  | 2             |
| 18   | 49            | 81  | 2             |
| 19   | 27            | 45  | 1             |
| 20   | 15            | 25  | 1             |
| 21   | 9             | 15  | 0             |
| 22   | 3             | 5   | 0             |
| 23   | 3             | 5   | 0             |
| 24   | 3             | 5   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 808    | 1            | 13     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 784    | 1            | 13     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 768    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 720    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 638    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 630    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 622    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 566    | 1            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 558    | 1            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 550    | 1            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 476    | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 444    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 436    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 324    | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 324    | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 226    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 130    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 130    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 72     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 40     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 24     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 8      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 8      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 8      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 19.2      |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 13        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 821       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | N    |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | N             |
| 1    | 307           | 293 | 52            |
| 2    | 298           | 284 | 50            |
| 3    | 292           | 278 | 49            |
| 4    | 273           | 261 | 46            |
| 5    | 243           | 231 | 41            |
| 6    | 239           | 229 | 41            |
| 7    | 236           | 226 | 40            |
| 8    | 215           | 205 | 36            |
| 9    | 212           | 202 | 36            |
| 10   | 209           | 199 | 35            |
| 11   | 181           | 173 | 31            |
| 12   | 169           | 161 | 29            |
| 13   | 166           | 158 | 28            |
| 14   | 123           | 117 | 21            |
| 15   | 123           | 117 | 21            |
| 16   | 86            | 82  | 15            |
| 17   | 49            | 47  | 8             |
| 18   | 49            | 47  | 8             |
| 19   | 28            | 26  | 5             |
| 20   | 15            | 15  | 3             |
| 21   | 9             | 9   | 2             |
| 22   | 3             | 3   | 1             |
| 23   | 3             | 3   | 1             |
| 24   | 3             | 3   | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 600    | 2            | 52     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 582    | 2            | 50     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 570    | 2            | 49     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 534    | 2            | 46     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 474    | 2            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 468    | 2            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 462    | 2            | 40     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 420    | 2            | 36     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 414    | 2            | 36     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 408    | 2            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 354    | 2            | 31     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 330    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 324    | 2            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 240    | 2            | 21     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 240    | 2            | 21     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 168    | 2            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 96     | 2            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 96     | 2            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 54     | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 30     | 2            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 18     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | N         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 15        |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:12      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 52        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 652       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 20            | 41 | 7             |
| 2    | 19            | 40 | 7             |
| 3    | 19            | 39 | 7             |
| 4    | 18            | 36 | 6             |
| 5    | 16            | 32 | 6             |
| 6    | 16            | 32 | 5             |
| 7    | 15            | 32 | 5             |
| 8    | 14            | 29 | 5             |
| 9    | 14            | 28 | 5             |
| 10   | 14            | 28 | 5             |
| 11   | 12            | 24 | 4             |
| 12   | 11            | 23 | 4             |
| 13   | 11            | 22 | 4             |
| 14   | 8             | 16 | 3             |
| 15   | 8             | 16 | 3             |
| 16   | 6             | 11 | 2             |
| 17   | 3             | 7  | 1             |
| 18   | 3             | 7  | 1             |
| 19   | 2             | 4  | 1             |
| 20   | 1             | 2  | 0             |
| 21   | 1             | 1  | 0             |
| 22   | 0             | 0  | 0             |
| 23   | 0             | 0  | 0             |
| 24   | 0             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 61     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 59     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 58     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 54     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 48     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 48     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 47     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 43     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 42     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 42     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 36     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 34     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 33     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 24     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 24     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 17     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 10     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 10     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 6      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.6       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 7         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 68        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 13            | 35 | 7             |
| 2    | 13            | 34 | 7             |
| 3    | 12            | 33 | 7             |
| 4    | 12            | 31 | 6             |
| 5    | 10            | 28 | 6             |
| 6    | 10            | 27 | 5             |
| 7    | 10            | 27 | 5             |
| 8    | 9             | 25 | 5             |
| 9    | 9             | 24 | 5             |
| 10   | 9             | 24 | 5             |
| 11   | 8             | 21 | 4             |
| 12   | 7             | 19 | 4             |
| 13   | 7             | 19 | 4             |
| 14   | 5             | 14 | 3             |
| 15   | 5             | 14 | 3             |
| 16   | 4             | 10 | 2             |
| 17   | 2             | 6  | 1             |
| 18   | 2             | 6  | 1             |
| 19   | 1             | 3  | 1             |
| 20   | 1             | 2  | 0             |
| 21   | 0             | 1  | 0             |
| 22   | 0             | 0  | 0             |
| 23   | 0             | 0  | 0             |
| 24   | 0             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 48     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 47     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 45     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 43     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 38     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 37     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 37     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 34     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 33     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 33     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 29     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 26     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 26     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 19     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 19     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 14     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 8      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 8      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 4      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.7       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 7         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 55        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Option 1: New signal timing. Double LT

|                               |                               |      |       |             |      |       |              |      |       |              |      |       |
|-------------------------------|-------------------------------|------|-------|-------------|------|-------|--------------|------|-------|--------------|------|-------|
| Number                        | 1                             |      |       |             |      |       |              |      |       |              |      |       |
| Intersection                  | Meridian Road/Stapleton Drive |      |       |             |      |       |              |      |       |              |      |       |
| Control Type                  | Signalized                    |      |       |             |      |       |              |      |       |              |      |       |
| Analysis Method               | HCM 7th Edition               |      |       |             |      |       |              |      |       |              |      |       |
| Name                          | Meridian Rd                   |      |       | Meridian Rd |      |       | Stapleton Dr |      |       | Stapleton Dr |      |       |
| Approach                      | Northbound                    |      |       | Southbound  |      |       | Eastbound    |      |       | Westbound    |      |       |
| Lane Configuration            |                               |      |       |             |      |       |              |      |       |              |      |       |
| Turning Movement              | Left                          | Thru | Right | Left        | Thru | Right | Left         | Thru | Right | Left         | Thru | Right |
| Base Volume Input [veh/h]     | 157                           | 346  | 141   | 110         | 980  | 9     | 15           | 75   | 252   | 350          | 145  | 155   |
| Total Analysis Volume [veh/h] | 173                           | 380  | 77    | 117         | 1043 | 4     | 18           | 90   | 152   | 438          | 181  | 96    |

## Intersection Settings

|                   |                              |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Cycle Length [s]  | 70                           |  |  |  |  |  |  |  |  |  |  |  |
| Active Pattern    | Pattern 1                    |  |  |  |  |  |  |  |  |  |  |  |
| Coordination Type | Time of Day Pattern Isolated |  |  |  |  |  |  |  |  |  |  |  |
| Actuation Type    | Fully actuated               |  |  |  |  |  |  |  |  |  |  |  |
| Lost time [s]     | 0.00                         |  |  |  |  |  |  |  |  |  |  |  |

## Phasing &amp; Timing (Basic)

|                            |         |         |         |         |         |         |         |         |         |         |         |         |
|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Control Type               | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss |
| Signal Group               | 1       | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7       | 4       | 0       |
| Auxiliary Signal Groups    |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]          | 20      | 70      | 0       | 20      | 70      | 0       | 5       | 40      | 0       | 5       | 40      | 0       |
| Amber [s]                  | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0     | 4.0     | 0.0     |
| All red [s]                | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 1.0     | 3.0     | 0.0     | 1.0     | 3.0     | 0.0     |
| Walk [s]                   | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       |
| Pedestrian Clearance [s]   | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0       | 15      | 0       |
| Delayed Vehicle Green [s]  | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| l1, Start-Up Lost Time [s] | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     |

## Phasing &amp; Timing: Pattern 1

|                   |      |    |   |      |    |   |      |    |   |      |    |   |
|-------------------|------|----|---|------|----|---|------|----|---|------|----|---|
| Split [s]         | 77   | 44 | 0 | 77   | 44 | 0 | 74   | 17 | 0 | 9    | 26 | 0 |
| Lead / Lag        | Lead | -  | - | Lead | -  | - | Lead | -  | - | Lead | -  | - |
| Minimum Green [s] | 5    | 10 | 0 | 5    | 10 | 0 | 5    | 10 | 0 | 5    | 10 | 0 |
| Minimum Recall    |      | No |   |      | No |   |      | No |   | No   | No |   |
| Maximum Recall    |      | No |   |      | No |   |      | No |   | No   | No |   |
| Pedestrian Recall |      | No |   |      | No |   |      | No |   | No   | No |   |

## Exclusive Pedestrian Phase

|                          |   |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------|---|--|--|--|--|--|--|--|--|--|--|--|
| Pedestrian Signal Group  | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Walk [s]      | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Clearance [s] | 0 |  |  |  |  |  |  |  |  |  |  |  |

## Lane Group Calculations

|                                               |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| g / C, Green / Cycle                          | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.52 | 0.14 | 0.14 | 0.14 | 0.27 | 0.27 | 0.27 |
| (v / s)_i Volume / Saturation Flow Rate       | 0.32 | 0.11 | 0.05 | 0.13 | 0.29 | 0.00 | 0.02 | 0.05 | 0.10 | 0.16 | 0.10 | 0.06 |
| so, Base Saturation Flow per Lane [pc/h/lane] | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Arrival type                                  | 3    |      |      | 3    |      |      | 3    |      |      | 3    |      |      |
| saturation flow rate [veh/h]                  | 530  | 3500 | 4500 | 334  | 3500 | 4500 | 4400 | 4070 | 4500 | 3670 | 4070 | 4500 |

Version 2024 (SP 0-6)

|                                       |        |       |       |       |        |      |       |       |        |        |       |       |
|---------------------------------------|--------|-------|-------|-------|--------|------|-------|-------|--------|--------|-------|-------|
| s, saturation flow rate [veh/min]     | 539    | 5500  | 1569  | 934   | 5500   | 1569 | 1102  | 1670  | 1569   | 2070   | 1670  | 1569  |
| c, Capacity [veh/h]                   | 262    | 1857  | 829   | 510   | 1857   | 829  | 143   | 267   | 227    | 831    | 508   | 431   |
| X, volume / capacity                  | 0.66   | 0.20  | 0.09  | 0.23  | 0.56   | 0.00 | 0.13  | 0.34  | 0.67   | 0.53   | 0.36  | 0.22  |
| d, Delay for Lane Group [s/veh]       | 37.71  | 9.22  | 8.65  | 13.77 | 12.57  | 8.05 | 33.44 | 27.75 | 31.82  | 22.03  | 20.99 | 20.03 |
| Lane Group LOS                        | D      | A     | A     | B     | B      | A    | C     | C     | C      | C      | C     | C     |
| Critical Lane Group                   | Yes    | No    | No    | No    | No     | No   | No    | No    | Yes    | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.36   | 1.19  | 0.48  | 1.08  | 4.22   | 0.02 | 0.29  | 1.29  | 2.42   | 2.72   | 2.18  | 1.11  |
| 50th-Percentile Queue Length [ft/ln]  | 83.94  | 29.71 | 11.97 | 26.93 | 105.41 | 0.59 | 7.33  | 32.34 | 60.40  | 67.96  | 54.61 | 27.85 |
| 95th-Percentile Queue Length [veh/ln] | 6.04   | 2.14  | 0.86  | 1.94  | 7.58   | 0.04 | 0.53  | 2.33  | 4.35   | 4.89   | 3.93  | 2.01  |
| 95th-Percentile Queue Length [ft/ln]  | 151.10 | 53.48 | 21.55 | 48.47 | 189.60 | 1.06 | 13.20 | 58.21 | 108.71 | 122.33 | 98.29 | 50.13 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 37.71 | 9.22 | 8.65 | 13.77 | 12.57 | 8.05 | 33.44 | 27.75 | 31.82 | 22.03 | 20.99 | 20.03 |
| Movement LOS                    | D     | A    | A    | B     | B     | A    | C     | C     | C     | C     | C     | C     |
| Critical Movement               | Yes   | No   | No   | No    | No    | No   | No    | No    | No    | No    | No    | No    |
| d_A, Approach Delay [s/veh]     | 16.98 |      |      | 12.68 |       |      | 30.53 |       |       | 21.50 |       |       |
| Approach LOS                    | B     |      |      | B     |       |      | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 17.61 |      |      |       |       |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |      |       |       |       |       |       |       |
| Intersection V/C                | 0.522 |      |      |       |       |      |       |       |       |       |       |       |

## Option 1: New signal timing. Dobule WBLT

|                               |                            |      |       |             |      |       |                |      |       |                |      |       |
|-------------------------------|----------------------------|------|-------|-------------|------|-------|----------------|------|-------|----------------|------|-------|
| Number                        | 2                          |      |       |             |      |       |                |      |       |                |      |       |
| Intersection                  | Meridian Rd/Londonderry Dr |      |       |             |      |       |                |      |       |                |      |       |
| Control Type                  | Signalized                 |      |       |             |      |       |                |      |       |                |      |       |
| Analysis Method               | HCM 7th Edition            |      |       |             |      |       |                |      |       |                |      |       |
| Name                          | Meridian Rd                |      |       | Meridian Rd |      |       | Londonderry Dr |      |       | Londonderry Dr |      |       |
| Approach                      | Northbound                 |      |       | Southbound  |      |       | Eastbound      |      |       | Westbound      |      |       |
| Lane Configuration            | 🚗🚗🚗                        |      |       | 🚗🚗🚗         |      |       | 🚗🚗             |      |       | 🚗🚗🚗            |      |       |
| Turning Movement              | Left                       | Thru | Right | Left        | Thru | Right | Left           | Thru | Right | Left           | Thru | Right |
| Base Volume Input [veh/h]     | 98                         | 328  | 109   | 70          | 411  | 57    | 102            | 131  | 263   | 397            | 176  | 169   |
| Total Analysis Volume [veh/h] | 120                        | 400  | 66    | 90          | 527  | 36    | 136            | 175  | 175   | 473            | 210  | 100   |

## Intersection Settings

|                   |                              |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Cycle Length [s]  | 70                           |  |  |  |  |  |  |  |  |  |  |  |
| Active Pattern    | Pattern 1                    |  |  |  |  |  |  |  |  |  |  |  |
| Coordination Type | Time of Day Pattern Isolated |  |  |  |  |  |  |  |  |  |  |  |
| Actuation Type    | Fully actuated               |  |  |  |  |  |  |  |  |  |  |  |
| Lost time [s]     | 0.00                         |  |  |  |  |  |  |  |  |  |  |  |

## Phasing &amp; Timing (Basic)

|                            |          |         |         |         |         |         |         |         |         |         |         |         |
|----------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Control Type               | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss |
| Signal Group               | 1        | 6       | 0       | 0       | 2       | 0       | 3       | 8       | 0       | 7       | 4       | 0       |
| Auxiliary Signal Groups    |          |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]          | 5        | 60      | 0       | 0       | 60      | 0       | 5       | 45      | 0       | 5       | 45      | 0       |
| Amber [s]                  | 3.0      | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0     | 4.0     | 0.0     |
| All red [s]                | 1.0      | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0     | 2.0     | 0.0     |
| Walk [s]                   | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       |
| Pedestrian Clearance [s]   | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0       | 21      | 0       |
| Delayed Vehicle Green [s]  | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I1, Start-Up Lost Time [s] | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     |

## Phasing &amp; Timing: Pattern 1

|                   |      |    |   |   |    |   |      |    |   |      |    |   |
|-------------------|------|----|---|---|----|---|------|----|---|------|----|---|
| Split [s]         | 12   | 42 | 0 | 0 | 30 | 0 | 74   | 19 | 0 | 9    | 28 | 0 |
| Lead / Lag        | Lead | -  | - | - | -  | - | Lead | -  | - | Lead | -  | - |
| Minimum Green [s] | 5    | 10 | 0 | 0 | 10 | 0 | 5    | 10 | 0 | 5    | 10 | 0 |
| Minimum Recall    | No   | No |   |   | No |   |      | No |   | No   | No |   |
| Maximum Recall    | No   | No |   |   | No |   |      | No |   | No   | No |   |
| Pedestrian Recall | No   | No |   |   | No |   |      | No |   | No   | No |   |

## Exclusive Pedestrian Phase

|                          |   |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------|---|--|--|--|--|--|--|--|--|--|--|--|
| Pedestrian Signal Group  | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Walk [s]      | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Clearance [s] | 0 |  |  |  |  |  |  |  |  |  |  |  |

## Lane Group Calculations

|                                               |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| g / C, Green / Cycle                          | 0.09 | 0.50 | 0.50 | 0.36 | 0.36 | 0.36 | 0.19 | 0.19 | 0.19 | 0.31 | 0.31 | 0.31 |
| (v / s)_i Volume / Saturation Flow Rate       | 0.07 | 0.11 | 0.04 | 0.10 | 0.15 | 0.02 | 0.13 | 0.09 | 0.11 | 0.19 | 0.11 | 0.06 |
| so, Base Saturation Flow per Lane [pc/h/lane] | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Arrival type                                  | 3    |      |      | 3    |      |      | 3    |      |      | 3    |      |      |
| saturation flow rate [veh/h]                  | 4704 | 3500 | 4500 | 3527 | 3500 | 4500 | 4000 | 4070 | 4500 | 3465 | 4070 | 4500 |

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| s, saturation flow rate [veh/min]     | 1781  | 3500  | 1569  | 927   | 3500   | 1569  | 1069   | 1670   | 1569   | 2465   | 1670   | 1569  |
|---------------------------------------|-------|-------|-------|-------|--------|-------|--------|--------|--------|--------|--------|-------|
| c, Capacity [veh/h]                   | 155   | 1780  | 795   | 344   | 1266   | 565   | 178    | 347    | 295    | 808    | 588    | 500   |
| X, volume / capacity                  | 0.77  | 0.22  | 0.08  | 0.26  | 0.42   | 0.06  | 0.76   | 0.50   | 0.59   | 0.59   | 0.36   | 0.20  |
| d, Delay for Lane Group [s/veh]       | 39.19 | 10.15 | 9.33  | 23.04 | 18.06  | 15.08 | 40.27  | 26.73  | 27.98  | 20.50  | 18.91  | 17.76 |
| Lane Group LOS                        | D     | B     | A     | C     | B      | B     | D      | C      | C      | C      | B      | B     |
| Critical Lane Group                   | Yes   | No    | No    | No    | Yes    | No    | Yes    | No     | No     | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.11  | 1.36  | 0.44  | 1.21  | 2.80   | 0.35  | 2.55   | 2.57   | 2.66   | 2.88   | 2.48   | 1.12  |
| 50th-Percentile Queue Length [ft/ln]  | 52.74 | 33.93 | 10.95 | 30.18 | 70.11  | 8.67  | 63.74  | 64.14  | 66.44  | 71.92  | 61.96  | 27.95 |
| 95th-Percentile Queue Length [veh/ln] | 3.80  | 2.44  | 0.79  | 2.17  | 5.05   | 0.62  | 4.59   | 4.62   | 4.78   | 5.18   | 4.46   | 2.01  |
| 95th-Percentile Queue Length [ft/ln]  | 94.94 | 61.07 | 19.70 | 54.32 | 126.19 | 15.61 | 114.74 | 115.45 | 119.59 | 129.45 | 111.52 | 50.31 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 39.19 | 10.15 | 9.33 | 23.04 | 18.06 | 15.08 | 40.27 | 26.73 | 27.98 | 20.50 | 18.91 | 17.76 |
| Movement LOS                    | D     | B     | A    | C     | B     | B     | D     | C     | C     | C     | B     | B     |
| Critical Movement               | No    | No    | No   | No    | No    | No    | Yes   | No    | No    | No    | No    | No    |
| d_A, Approach Delay [s/veh]     | 16.01 |       |      | 18.58 |       |       | 30.97 |       |       | 19.72 |       |       |
| Approach LOS                    | B     |       |      | B     |       |       | C     |       |       | B     |       |       |
| d_I, Intersection Delay [s/veh] | 20.74 |       |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.450 |       |      |       |       |       |       |       |       |       |       |       |

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 28.6  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.569 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 231         | 954    | 386    | 87          | 570    | 9      | 10           | 35     | 131    | 280          | 42     | 70     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 193    | 0           | 0      | 5      | 0            | 0      | 66     | 0            | 0      | 35     |
| Total Hourly Volume [veh/h]                 | 231         | 954    | 193    | 87          | 570    | 4      | 10           | 35     | 65     | 280          | 42     | 35     |
| Peak Hour Factor                            | 0.9200      | 0.9200 | 0.8600 | 0.9600      | 0.9600 | 0.9600 | 0.8000       | 0.8000 | 0.8000 | 0.8700       | 0.8700 | 0.8700 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 63          | 259    | 56     | 23          | 148    | 1      | 3            | 11     | 20     | 80           | 12     | 10     |
| Total Analysis Volume [veh/h]               | 251         | 1037   | 224    | 91          | 594    | 4      | 13           | 44     | 81     | 322          | 48     | 40     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 90                                    |
| Active Pattern            | Free Running (No Pattern)             |
| Coordination Type         | <i>Free Running</i>                   |
| Actuation Type            | <i>Fully actuated</i>                 |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal Group                    | 1       | 6       | 0       | 5       | 2       | 0       | 0       | 8       | 0       | 0       | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]               | 20      | 70      | 0       | 20      | 70      | 0       | 0       | 40      | 0       | 0       | 40      | 0       |
| Amber [s]                       | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                     | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 0.0     | 3.0     | 0.0     | 0.0     | 3.0     | 0.0     |
| Walk [s]                        | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       |
| Pedestrian Clearance [s]        | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0       | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0     | 5.5     | 0.0     | 5.0     | 5.5     | 0.0     | 0.0     | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Phasing & Timing: Free Running (No Pattern)**

|                       |      |     |     |      |     |     |     |     |     |     |     |     |
|-----------------------|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|
| Split [s]             | 9    | 41  | 0   | 9    | 41  | 0   | 0   | 29  | 0   | 0   | 29  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | -   | -   | -   | -   | -   | -   |
| Minimum Green [s]     | 5    | 20  | 0   | 5    | 20  | 0   | 0   | 10  | 0   | 0   | 10  | 0   |
| Vehicle Extension [s] | 2.0  | 2.0 | 0.0 | 2.0  | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     |     | No  |     |     | No  |     |
| Maximum Recall        | No   | Yes |     | No   | Yes |     |     | No  |     |     | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     |     | No  |     |     | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 143   | 143   | 143   | 143   | 143   | 143   | 143   | 143   | 143   | 143   | 143   | 143   |
| L, Total Lost Time per Cycle [s]        | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 5.50  | 5.50  | 0.00  | 5.50  | 5.50  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 88    | 76    | 76    | 88    | 70    | 70    | 40    | 40    | 40    | 40    | 40    | 40    |
| g / C, Green / Cycle                    | 0.62  | 0.53  | 0.53  | 0.62  | 0.49  | 0.49  | 0.28  | 0.28  | 0.28  | 0.28  | 0.28  | 0.28  |
| (v / s)_i Volume / Saturation Flow Rate | 0.25  | 0.29  | 0.14  | 0.15  | 0.17  | 0.00  | 0.01  | 0.02  | 0.05  | 0.25  | 0.03  | 0.03  |
| s, saturation flow rate [veh/h]         | 996   | 3560  | 1589  | 592   | 3560  | 1589  | 1309  | 1870  | 1589  | 1266  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 607   | 1901  | 849   | 355   | 1747  | 780   | 374   | 524   | 446   | 365   | 524   | 446   |
| d1, Uniform Delay [s]                   | 13.20 | 21.86 | 18.03 | 14.39 | 22.22 | 18.56 | 40.82 | 37.84 | 38.93 | 53.97 | 37.92 | 37.90 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.04  | 0.04  | 0.04  | 0.32  | 0.04  | 0.04  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 2.07  | 1.13  | 0.76  | 1.74  | 0.53  | 0.01  | 0.01  | 0.03  | 0.07  | 17.67 | 0.03  | 0.03  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |        |       |       |       |       |        |       |       |
|---------------------------------------|--------|--------|--------|-------|--------|-------|-------|-------|-------|--------|-------|-------|
| X, volume / capacity                  | 0.41   | 0.55   | 0.26   | 0.26  | 0.34   | 0.01  | 0.03  | 0.08  | 0.18  | 0.88   | 0.09  | 0.09  |
| d, Delay for Lane Group [s/veh]       | 15.27  | 22.99  | 18.79  | 16.13 | 22.75  | 18.57 | 40.84 | 37.86 | 39.00 | 71.63  | 37.95 | 37.93 |
| Lane Group LOS                        | B      | C      | B      | B     | C      | B     | D     | D     | D     | E      | D     | D     |
| Critical Lane Group                   | No     | Yes    | No     | Yes   | No     | No    | No    | No    | No    | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.60   | 10.86  | 3.94   | 1.24  | 5.89   | 0.07  | 0.35  | 1.13  | 2.14  | 13.11  | 1.23  | 1.03  |
| 50th-Percentile Queue Length [ft/ln]  | 89.96  | 271.38 | 98.54  | 30.94 | 147.21 | 1.68  | 8.66  | 28.19 | 53.45 | 327.64 | 30.83 | 25.69 |
| 95th-Percentile Queue Length [veh/ln] | 6.48   | 16.26  | 7.09   | 2.23  | 9.87   | 0.12  | 0.62  | 2.03  | 3.85  | 19.04  | 2.22  | 1.85  |
| 95th-Percentile Queue Length [ft/ln]  | 161.92 | 406.46 | 177.37 | 55.69 | 246.70 | 3.03  | 15.58 | 50.75 | 96.21 | 476.07 | 55.49 | 46.24 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 15.27 | 22.99 | 18.79 | 16.13 | 22.75 | 18.57 | 40.84 | 37.86 | 39.00 | 71.63 | 37.95 | 37.93 |
| Movement LOS                    | B     | C     | B     | B     | C     | B     | D     | D     | D     | E     | D     | D     |
| d_A, Approach Delay [s/veh]     | 21.08 |       |       | 21.85 |       |       | 38.81 |       |       | 64.40 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | D     |       |       | E     |       |       |
| d_I, Intersection Delay [s/veh] | 28.63 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.569 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

|                              |        |         |        |       |        |      |       |       |        |        |       |       |
|------------------------------|--------|---------|--------|-------|--------|------|-------|-------|--------|--------|-------|-------|
| Vehicle Miles Traveled [mph] | 102.61 | 423.95  | 91.58  | 8.88  | 57.99  | 0.39 | 1.28  | 4.33  | 7.97   | 67.24  | 10.02 | 8.35  |
| Stops [stops/h]              | 90.81  | 547.93  | 99.48  | 31.23 | 297.22 | 1.70 | 8.74  | 28.46 | 53.96  | 330.76 | 31.12 | 25.93 |
| Fuel consumption [US gal/h]  | 5.90   | 29.21   | 5.77   | 1.18  | 10.21  | 0.06 | 0.26  | 0.84  | 1.59   | 11.11  | 1.10  | 0.92  |
| CO [g/h]                     | 412.38 | 2041.76 | 403.15 | 82.20 | 713.67 | 4.18 | 18.21 | 58.80 | 110.92 | 776.62 | 76.97 | 64.13 |
| NOx [g/h]                    | 80.23  | 397.25  | 78.44  | 15.99 | 138.85 | 0.81 | 3.54  | 11.44 | 21.58  | 151.10 | 14.97 | 12.48 |
| VOC [g/h]                    | 95.57  | 473.20  | 93.43  | 19.05 | 165.40 | 0.97 | 4.22  | 13.63 | 25.71  | 179.99 | 17.84 | 14.86 |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | F     |  |  | F     |  |  | F     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 981   |  |  | 981   |  |  | 561   |  |  | 561   |  |  |
| d_b, Bicycle Delay [s]                                   | 18.50 |  |  | 18.50 |  |  | 36.93 |  |  | 36.93 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.966 |  |  | 2.132 |  |  | 1.896 |  |  | 2.294 |  |  |
| Bicycle LOS                                              | C     |  |  | B     |  |  | A     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 17.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.392 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 124         | 449    | 370    | 111         | 364    | 58     | 35             | 44     | 84     | 287            | 58     | 40     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 185    | 0           | 0      | 29     | 0              | 0      | 42     | 0              | 0      | 20     |
| Total Hourly Volume [veh/h]                 | 124         | 449    | 185    | 111         | 364    | 29     | 35             | 44     | 42     | 287            | 58     | 20     |
| Peak Hour Factor                            | 0.9000      | 0.9000 | 0.9000 | 0.9300      | 0.9300 | 0.9300 | 0.8100         | 0.8100 | 0.8100 | 0.9600         | 0.9600 | 0.9600 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 34          | 125    | 51     | 30          | 98     | 8      | 11             | 14     | 13     | 75             | 15     | 5      |
| Total Analysis Volume [veh/h]               | 138         | 499    | 206    | 119         | 391    | 31     | 43             | 54     | 52     | 299            | 60     | 21     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 90                                    |
| Active Pattern            | Free Running (No Pattern)             |
| Coordination Type         | <i>Free Running</i>                   |
| Actuation Type            | <i>Fully actuated</i>                 |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal Group                    | 0       | 6       | 0       | 0       | 2       | 0       | 0       | 8       | 0       | 0       | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]               | 0       | 60      | 0       | 0       | 60      | 0       | 0       | 45      | 0       | 0       | 45      | 0       |
| Amber [s]                       | 0.0     | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| All red [s]                     | 0.0     | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| Walk [s]                        | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       |
| Pedestrian Clearance [s]        | 0       | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0       | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]      | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 0.0     | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 0.0     | 4.0     | 0.0     | 0.0     | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Phasing & Timing: Free Running (No Pattern)**

|                       |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Split [s]             | 0   | 37  | 0   | 0   | 37  | 0   | 0   | 33  | 0   | 0   | 33  | 0   |
| Lead / Lag            | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| Minimum Green [s]     | 0   | 25  | 0   | 0   | 25  | 0   | 0   | 8   | 0   | 0   | 8   | 0   |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Minimum Recall        |     | No  |     |     | No  |     |     | No  |     |     | No  |     |
| Maximum Recall        |     | Yes |     |     | Yes |     |     | No  |     |     | No  |     |
| Pedestrian Recall     |     | No  |     |     | No  |     |     | No  |     |     | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | R    | L     | C    | R    | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 100   | 100  | 100  | 100   | 100  | 100  | 100   | 100   | 100   | 100   | 100   | 100   |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.00 | 7.00 | 7.00  | 7.00 | 7.00 | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.00 | 5.00 | 5.00  | 5.00 | 5.00 | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 60    | 60   | 60   | 60    | 60   | 60   | 27    | 27    | 27    | 27    | 27    | 27    |
| g / C, Green / Cycle                    | 0.60  | 0.60 | 0.60 | 0.60  | 0.60 | 0.60 | 0.27  | 0.27  | 0.27  | 0.27  | 0.27  | 0.27  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.14 | 0.13 | 0.16  | 0.11 | 0.02 | 0.03  | 0.03  | 0.03  | 0.23  | 0.03  | 0.01  |
| s, saturation flow rate [veh/h]         | 965   | 3560 | 1589 | 743   | 3560 | 1589 | 1317  | 1870  | 1589  | 1288  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 578   | 2137 | 954  | 448   | 2137 | 954  | 404   | 504   | 429   | 399   | 504   | 429   |
| d1, Uniform Delay [s]                   | 13.20 | 9.29 | 9.18 | 14.51 | 8.97 | 8.15 | 28.92 | 27.45 | 27.56 | 36.25 | 27.54 | 27.01 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 0.97  | 0.26 | 0.52 | 1.45  | 0.19 | 0.06 | 0.11  | 0.09  | 0.13  | 2.85  | 0.10  | 0.05  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |       |       |       |       |       |       |       |       |       |        |       |       |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| X, volume / capacity                  | 0.24  | 0.23  | 0.22  | 0.27  | 0.18  | 0.03  | 0.11  | 0.11  | 0.12  | 0.75   | 0.12  | 0.05  |
| d, Delay for Lane Group [s/veh]       | 14.17 | 9.54  | 9.69  | 15.95 | 9.16  | 8.21  | 29.03 | 27.54 | 27.68 | 39.10  | 27.64 | 27.06 |
| Lane Group LOS                        | B     | A     | A     | B     | A     | A     | C     | C     | C     | D      | C     | C     |
| Critical Lane Group                   | No    | No    | No    | Yes   | No    | No    | No    | No    | No    | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 1.64  | 2.13  | 1.82  | 1.56  | 1.61  | 0.24  | 0.80  | 0.97  | 0.94  | 7.17   | 1.08  | 0.37  |
| 50th-Percentile Queue Length [ft/ln]  | 40.97 | 53.37 | 45.42 | 38.88 | 40.36 | 6.03  | 19.95 | 24.19 | 23.44 | 179.34 | 26.97 | 9.27  |
| 95th-Percentile Queue Length [veh/ln] | 2.95  | 3.84  | 3.27  | 2.80  | 2.91  | 0.43  | 1.44  | 1.74  | 1.69  | 11.57  | 1.94  | 0.67  |
| 95th-Percentile Queue Length [ft/ln]  | 73.74 | 96.07 | 81.76 | 69.98 | 72.64 | 10.85 | 35.91 | 43.54 | 42.20 | 289.16 | 48.54 | 16.69 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 14.17 | 9.54 | 9.69 | 15.95 | 9.16 | 8.21 | 29.03 | 27.54 | 27.68 | 39.10 | 27.64 | 27.06 |
| Movement LOS                    | B     | A    | A    | B     | A    | A    | C     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 10.34 |      |      | 10.60 |      |      | 28.02 |       |       | 36.63 |       |       |
| Approach LOS                    | B     |      |      | B     |      |      | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 17.01 |      |      |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.392 |      |      |       |      |      |       |       |       |       |       |       |

**Emissions**

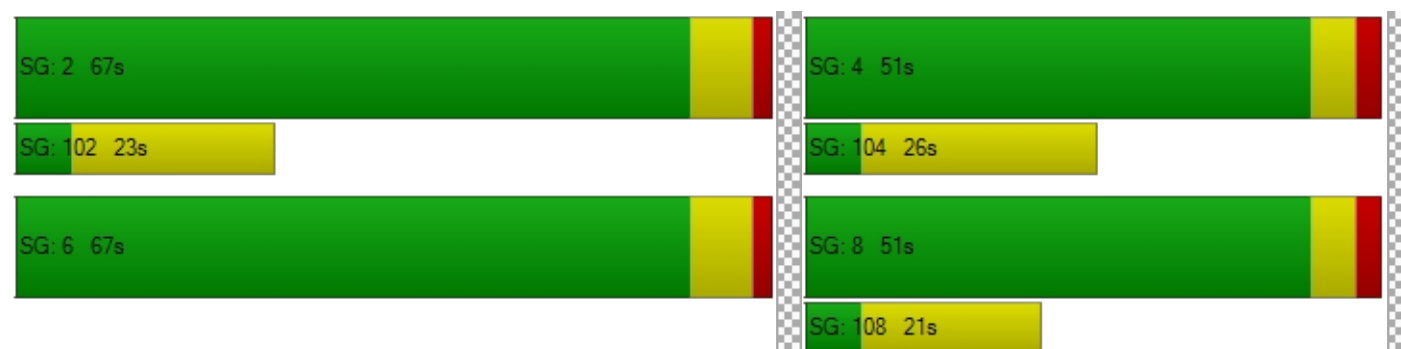
|                              |        |        |        |        |        |       |       |       |       |        |       |       |
|------------------------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|-------|-------|
| Vehicle Miles Traveled [mph] | 45.36  | 164.02 | 67.71  | 29.53  | 97.02  | 7.69  | 14.10 | 17.71 | 17.05 | 45.60  | 9.15  | 3.20  |
| Stops [stops/h]              | 58.98  | 153.69 | 65.39  | 55.98  | 116.20 | 8.68  | 28.72 | 34.82 | 33.75 | 258.21 | 38.83 | 13.35 |
| Fuel consumption [US gal/h]  | 3.01   | 9.31   | 3.89   | 2.41   | 6.13   | 0.47  | 1.01  | 1.24  | 1.20  | 6.06   | 0.98  | 0.34  |
| CO [g/h]                     | 210.47 | 650.81 | 271.64 | 168.73 | 428.69 | 32.88 | 70.42 | 86.64 | 83.65 | 423.54 | 68.39 | 23.63 |
| NOx [g/h]                    | 40.95  | 126.62 | 52.85  | 32.83  | 83.41  | 6.40  | 13.70 | 16.86 | 16.27 | 82.41  | 13.31 | 4.60  |
| VOC [g/h]                    | 48.78  | 150.83 | 62.95  | 39.10  | 99.35  | 7.62  | 16.32 | 20.08 | 19.39 | 98.16  | 15.85 | 5.48  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 41.41 |  |  | 41.41 |  |  | 41.41 |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.688 |  |  | 2.905 |  |  | 2.521 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | D     |  |  | C     |  |  | B     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1200  |  |  | 1200  |  |  | 900   |  |  | 900   |  |  |
| d_b, Bicycle Delay [s]                                   | 8.01  |  |  | 8.01  |  |  | 15.13 |  |  | 15.13 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.408 |  |  | 2.030 |  |  | 1.875 |  |  | 2.220 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | A     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 10.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.011 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 3                | 1      | 142            | 1      | 6              | 168    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0              | 0      | 0              | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 3                | 1      | 142            | 1      | 6              | 168    |
| Peak Hour Factor                        | 0.4200           | 0.4200 | 0.7400         | 0.7400 | 0.9800         | 0.9800 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2                | 1      | 48             | 0      | 2              | 43     |
| Total Analysis Volume [veh/h]           | 7                | 2      | 192            | 1      | 6              | 171    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 10.85 | 9.31 | 0.00 | 0.00 | 7.62 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.04  | 0.04 | 0.00 | 0.00 | 0.01 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 1.03  | 1.03 | 0.00 | 0.00 | 0.33 | 0.00 |
| d_A, Approach Delay [s/veh]           | 10.51 |      | 0.00 |      | 0.26 |      |
| Approach LOS                          | B     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.37  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 11.6  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.052 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Stapleton Dr                                                                        |        | Stapleton Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Southbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Left                                                                                | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 1      |
| Entry Pocket Length [ft]     | 285.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 115.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 45.00                                                                               |        | 45.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|-----------------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 25               | 1      | 1            | 151    | 236          | 57     |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00         | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| In-Process Volume [veh/h]               | 0                | 0      | 0            | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0            | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0            | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0            | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0            | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0            | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 25               | 1      | 1            | 151    | 236          | 57     |
| Peak Hour Factor                        | 0.8300           | 0.8300 | 0.8600       | 0.8600 | 0.9100       | 0.9100 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 8                | 0      | 0            | 44     | 65           | 16     |
| Total Analysis Volume [veh/h]           | 30               | 1      | 1            | 176    | 259          | 63     |
| Pedestrian Volume [ped/h]               | 0                |        | 0            |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.05  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 11.59 | 9.62 | 7.91 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.16  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 4.11  | 0.10 | 0.04 | 0.04 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 11.53 |      | 0.04 |      | 0.00 |      |
| Approach LOS                          | B     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.69  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 8.5   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.009 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Southbound                                                                          |        | Waterbury Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 30.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Southbound |        | Waterbury Dr |        |
|-----------------------------------------|------------------|--------|------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 15               | 43     | 21         | 0      | 0            | 5      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00       | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| In-Process Volume [veh/h]               | 0                | 0      | 0          | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0          | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0          | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0          | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0          | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0          | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 15               | 43     | 21         | 0      | 0            | 5      |
| Peak Hour Factor                        | 0.6900           | 0.6900 | 0.8600     | 0.8600 | 0.5600       | 0.5600 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5                | 16     | 6          | 0      | 0            | 2      |
| Total Analysis Volume [veh/h]           | 22               | 62     | 24         | 0      | 0            | 9      |
| Pedestrian Volume [ped/h]               | 0                |        | 0          |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.29 | 0.00 | 0.00 | 0.00 | 9.26 | 8.45 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.04 | 0.04 | 0.00 | 0.00 | 0.03 | 0.03 |
| 95th-Percentile Queue Length [ft/ln]  | 0.93 | 0.93 | 0.00 | 0.00 | 0.65 | 0.65 |
| d_A, Approach Delay [s/veh]           | 1.91 |      | 0.00 |      | 8.45 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 2.02 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.0   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.007 |

#### Intersection Setup

| Name                         |                                                                                   |        | Liberty Grove Dr                                                                    |        | Salem Ct                                                                            |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 25.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    |        |        | Liberty Grove Dr |        | Salem Ct |        |
|-----------------------------------------|--------|--------|------------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 9      | 36     | 17               | 2      | 2        | 3      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00             | 2.00   | 2.00     | 2.00   |
| Growth Factor                           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| In-Process Volume [veh/h]               | 0      | 0      | 0                | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0                | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0                | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0                | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0                | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0                | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 9      | 36     | 17               | 2      | 2        | 3      |
| Peak Hour Factor                        | 0.7500 | 0.7500 | 0.9600           | 0.9600 | 0.3100   | 0.3100 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3      | 12     | 4                | 1      | 2        | 2      |
| Total Analysis Volume [veh/h]           | 12     | 48     | 18               | 2      | 6        | 10     |
| Pedestrian Volume [ped/h]               | 0      |        | 0                |        | 0        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.27 | 0.00 | 0.00 | 0.00 | 9.05 | 8.46 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.00 | 0.00 | 0.05 | 0.05 |
| 95th-Percentile Queue Length [ft/ln]  | 0.50 | 0.50 | 0.00 | 0.00 | 1.23 | 1.23 |
| d_A, Approach Delay [s/veh]           | 1.45 |      | 0.00 |      | 8.68 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 2.36 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 174           | 143 | 4             |
| 2    | 169           | 139 | 4             |
| 3    | 165           | 136 | 4             |
| 4    | 155           | 127 | 4             |
| 5    | 137           | 113 | 3             |
| 6    | 136           | 112 | 3             |
| 7    | 134           | 110 | 3             |
| 8    | 122           | 100 | 3             |
| 9    | 120           | 99  | 3             |
| 10   | 118           | 97  | 3             |
| 11   | 103           | 84  | 2             |
| 12   | 96            | 79  | 2             |
| 13   | 94            | 77  | 2             |
| 14   | 70            | 57  | 2             |
| 15   | 70            | 57  | 2             |
| 16   | 49            | 40  | 1             |
| 17   | 28            | 23  | 1             |
| 18   | 28            | 23  | 1             |
| 19   | 16            | 13  | 0             |
| 20   | 9             | 7   | 0             |
| 21   | 5             | 4   | 0             |
| 22   | 2             | 1   | 0             |
| 23   | 2             | 1   | 0             |
| 24   | 2             | 1   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 317    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 308    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 301    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 282    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 250    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 248    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 244    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 222    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 219    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 215    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 187    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 175    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 171    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 127    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 127    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 89     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 51     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 51     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 29     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 16     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 9      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 10.5      |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 4         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 321       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | N    |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | N             |
| 1    | 293           | 152 | 26            |
| 2    | 284           | 147 | 25            |
| 3    | 278           | 144 | 25            |
| 4    | 261           | 135 | 23            |
| 5    | 231           | 120 | 21            |
| 6    | 229           | 119 | 20            |
| 7    | 226           | 117 | 20            |
| 8    | 205           | 106 | 18            |
| 9    | 202           | 105 | 18            |
| 10   | 199           | 103 | 18            |
| 11   | 173           | 90  | 15            |
| 12   | 161           | 84  | 14            |
| 13   | 158           | 82  | 14            |
| 14   | 117           | 61  | 10            |
| 15   | 117           | 61  | 10            |
| 16   | 82            | 43  | 7             |
| 17   | 47            | 24  | 4             |
| 18   | 47            | 24  | 4             |
| 19   | 26            | 14  | 2             |
| 20   | 15            | 8   | 1             |
| 21   | 9             | 5   | 1             |
| 22   | 3             | 2   | 0             |
| 23   | 3             | 2   | 0             |
| 24   | 3             | 2   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 445    | 2            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 431    | 2            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 422    | 2            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 396    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 351    | 2            | 21     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 348    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 343    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 311    | 2            | 18     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 307    | 2            | 18     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 302    | 2            | 18     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 263    | 2            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 245    | 2            | 14     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 240    | 2            | 14     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 178    | 2            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 178    | 2            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 125    | 2            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 71     | 2            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 71     | 2            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 40     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 23     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 14     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 5      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 5      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 5      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | N         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 11.5      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 26        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 471       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 58            | 21 | 5             |
| 2    | 56            | 20 | 5             |
| 3    | 55            | 20 | 5             |
| 4    | 52            | 19 | 4             |
| 5    | 46            | 17 | 4             |
| 6    | 45            | 16 | 4             |
| 7    | 45            | 16 | 4             |
| 8    | 41            | 15 | 4             |
| 9    | 40            | 14 | 3             |
| 10   | 39            | 14 | 3             |
| 11   | 34            | 12 | 3             |
| 12   | 32            | 12 | 3             |
| 13   | 31            | 11 | 3             |
| 14   | 23            | 8  | 2             |
| 15   | 23            | 8  | 2             |
| 16   | 16            | 6  | 1             |
| 17   | 9             | 3  | 1             |
| 18   | 9             | 3  | 1             |
| 19   | 5             | 2  | 0             |
| 20   | 3             | 1  | 0             |
| 21   | 2             | 1  | 0             |
| 22   | 1             | 0  | 0             |
| 23   | 1             | 0  | 0             |
| 24   | 1             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 79     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 76     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 75     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 71     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 63     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 61     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 61     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 56     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 54     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 53     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 46     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 44     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 42     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 31     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 31     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 22     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 12     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 12     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 7      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.5       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 5         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 84        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 45            | 19 | 5             |
| 2    | 44            | 18 | 5             |
| 3    | 43            | 18 | 5             |
| 4    | 40            | 17 | 4             |
| 5    | 36            | 15 | 4             |
| 6    | 35            | 15 | 4             |
| 7    | 35            | 15 | 4             |
| 8    | 31            | 13 | 4             |
| 9    | 31            | 13 | 3             |
| 10   | 31            | 13 | 3             |
| 11   | 27            | 11 | 3             |
| 12   | 25            | 10 | 3             |
| 13   | 24            | 10 | 3             |
| 14   | 18            | 8  | 2             |
| 15   | 18            | 8  | 2             |
| 16   | 13            | 5  | 1             |
| 17   | 7             | 3  | 1             |
| 18   | 7             | 3  | 1             |
| 19   | 4             | 2  | 0             |
| 20   | 2             | 1  | 0             |
| 21   | 1             | 1  | 0             |
| 22   | 0             | 0  | 0             |
| 23   | 0             | 0  | 0             |
| 24   | 0             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 64     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 62     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 61     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 57     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 51     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 50     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 50     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 44     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 44     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 44     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 38     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 35     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 34     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 26     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 26     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 18     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 10     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 10     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 6      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.7       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 5         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 69        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Option 1: new signal timing. Double WBLT

|                               |                               |      |       |             |      |       |              |      |       |              |      |       |
|-------------------------------|-------------------------------|------|-------|-------------|------|-------|--------------|------|-------|--------------|------|-------|
| Number                        | 1                             |      |       |             |      |       |              |      |       |              |      |       |
| Intersection                  | Meridian Road/Stapleton Drive |      |       |             |      |       |              |      |       |              |      |       |
| Control Type                  | Signalized                    |      |       |             |      |       |              |      |       |              |      |       |
| Analysis Method               | HCM 7th Edition               |      |       |             |      |       |              |      |       |              |      |       |
| Name                          | Meridian Rd                   |      |       | Meridian Rd |      |       | Stapleton Dr |      |       | Stapleton Dr |      |       |
| Approach                      | Northbound                    |      |       | Southbound  |      |       | Eastbound    |      |       | Westbound    |      |       |
| Lane Configuration            | 🚗🚗🚗                           |      |       | 🚗🚗🚗         |      |       | 🚗🚗           |      |       | 🚗🚗🚗          |      |       |
| Turning Movement              | Left                          | Thru | Right | Left        | Thru | Right | Left         | Thru | Right | Left         | Thru | Right |
| Base Volume Input [veh/h]     | 231                           | 954  | 386   | 87          | 570  | 9     | 10           | 35   | 131   | 280          | 42   | 70    |
| Total Analysis Volume [veh/h] | 251                           | 1037 | 224   | 91          | 594  | 4     | 13           | 44   | 81    | 322          | 48   | 40    |

## Intersection Settings

|                   |                              |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Cycle Length [s]  | 90                           |  |  |  |  |  |  |  |  |  |  |  |
| Active Pattern    | Pattern 1                    |  |  |  |  |  |  |  |  |  |  |  |
| Coordination Type | Time of Day Pattern Isolated |  |  |  |  |  |  |  |  |  |  |  |
| Actuation Type    | Fully actuated               |  |  |  |  |  |  |  |  |  |  |  |
| Lost time [s]     | 0.00                         |  |  |  |  |  |  |  |  |  |  |  |

## Phasing &amp; Timing (Basic)

|                            |         |         |         |         |         |         |         |         |         |         |         |         |
|----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Control Type               | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss |
| Signal Group               | 1       | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7       | 4       | 0       |
| Auxiliary Signal Groups    |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]          | 20      | 70      | 0       | 20      | 70      | 0       | 5       | 40      | 0       | 5       | 40      | 0       |
| Amber [s]                  | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0     | 4.0     | 0.0     |
| All red [s]                | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 1.0     | 3.0     | 0.0     | 1.0     | 3.0     | 0.0     |
| Walk [s]                   | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       |
| Pedestrian Clearance [s]   | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0       | 15      | 0       |
| Delayed Vehicle Green [s]  | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I1, Start-Up Lost Time [s] | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     |

## Phasing &amp; Timing: Pattern 1

|                   |      |    |   |      |    |   |      |    |   |      |    |   |
|-------------------|------|----|---|------|----|---|------|----|---|------|----|---|
| Split [s]         | 97   | 52 | 0 | 97   | 52 | 0 | 94   | 29 | 0 | 9    | 38 | 0 |
| Lead / Lag        | Lead | -  | - | Lead | -  | - | Lead | -  | - | Lead | -  | - |
| Minimum Green [s] | 5    | 10 | 0 | 5    | 10 | 0 | 5    | 10 | 0 | 5    | 10 | 0 |
| Minimum Recall    |      | No |   |      | No |   |      | No |   | No   | No |   |
| Maximum Recall    |      | No |   |      | No |   |      | No |   | No   | No |   |
| Pedestrian Recall |      | No |   |      | No |   |      | No |   | No   | No |   |

## Exclusive Pedestrian Phase

|                          |   |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------|---|--|--|--|--|--|--|--|--|--|--|--|
| Pedestrian Signal Group  | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Walk [s]      | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Clearance [s] | 0 |  |  |  |  |  |  |  |  |  |  |  |

## Lane Group Calculations

|                                               |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| g / C, Green / Cycle                          | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.11 | 0.11 | 0.11 | 0.21 | 0.21 | 0.21 |
| (v / s)_i Volume / Saturation Flow Rate       | 0.31 | 0.29 | 0.14 | 0.21 | 0.17 | 0.00 | 0.01 | 0.02 | 0.05 | 0.11 | 0.03 | 0.03 |
| so, Base Saturation Flow per Lane [pc/h/lane] | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Arrival type                                  | 3    |      |      | 3    |      |      | 3    |      |      | 3    |      |      |
| saturation flow rate [veh/h]                  | 300  | 3500 | 4500 | 440  | 3500 | 4500 | 4000 | 4070 | 4500 | 3000 | 4070 | 4500 |

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| s, saturation flow rate [veh/min]     | 020    | 3500   | 1569  | 440   | 3500  | 1569 | 1309  | 1670  | 1569  | 2629   | 1670  | 1569  |
|---------------------------------------|--------|--------|-------|-------|-------|------|-------|-------|-------|--------|-------|-------|
| c, Capacity [veh/h]                   | 510    | 2240   | 1000  | 275   | 2240  | 1000 | 176   | 205   | 174   | 712    | 392   | 333   |
| X, volume / capacity                  | 0.49   | 0.46   | 0.22  | 0.33  | 0.27  | 0.00 | 0.07  | 0.21  | 0.46  | 0.45   | 0.12  | 0.12  |
| d, Delay for Lane Group [s/veh]       | 18.09  | 9.42   | 7.72  | 20.81 | 7.72  | 6.21 | 39.20 | 37.04 | 39.50 | 31.51  | 28.98 | 28.99 |
| Lane Group LOS                        | B      | A      | A     | C     | A     | A    | D     | D     | D     | C      | C     | C     |
| Critical Lane Group                   | Yes    | No     | No    | No    | No    | No   | No    | No    | Yes   | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.32   | 4.04   | 1.51  | 1.38  | 1.95  | 0.02 | 0.27  | 0.87  | 1.69  | 2.92   | 0.81  | 0.68  |
| 50th-Percentile Queue Length [ft/ln]  | 83.02  | 100.90 | 37.65 | 34.46 | 48.80 | 0.57 | 6.66  | 21.82 | 42.26 | 73.10  | 20.35 | 17.01 |
| 95th-Percentile Queue Length [veh/ln] | 5.98   | 7.27   | 2.71  | 2.48  | 3.51  | 0.04 | 0.48  | 1.57  | 3.04  | 5.26   | 1.47  | 1.22  |
| 95th-Percentile Queue Length [ft/ln]  | 149.44 | 181.63 | 67.77 | 62.03 | 87.84 | 1.03 | 11.98 | 39.28 | 76.08 | 131.57 | 36.63 | 30.61 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 18.09 | 9.42 | 7.72 | 20.81 | 7.72 | 6.21 | 39.20 | 37.04 | 39.50 | 31.51 | 28.98 | 28.99 |
| Movement LOS                    | B     | A    | A    | C     | A    | A    | D     | D     | D     | C     | C     | C     |
| Critical Movement               | No    | No   | No   | No    | No   | No   | No    | No    | Yes   | No    | No    | No    |
| d_A, Approach Delay [s/veh]     | 10.61 |      |      | 9.44  |      |      | 38.69 |       |       | 30.97 |       |       |
| Approach LOS                    | B     |      |      | A     |      |      | D     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 14.76 |      |      |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.438 |      |      |       |      |      |       |       |       |       |       |       |

## Option 1: New timing. Double WBLT

|                               |                            |      |       |             |      |       |                |      |       |                |      |       |
|-------------------------------|----------------------------|------|-------|-------------|------|-------|----------------|------|-------|----------------|------|-------|
| Number                        | 2                          |      |       |             |      |       |                |      |       |                |      |       |
| Intersection                  | Meridian Rd/Londonderry Dr |      |       |             |      |       |                |      |       |                |      |       |
| Control Type                  | Signalized                 |      |       |             |      |       |                |      |       |                |      |       |
| Analysis Method               | HCM 7th Edition            |      |       |             |      |       |                |      |       |                |      |       |
| Name                          | Meridian Rd                |      |       | Meridian Rd |      |       | Londonderry Dr |      |       | Londonderry Dr |      |       |
| Approach                      | Northbound                 |      |       | Southbound  |      |       | Eastbound      |      |       | Westbound      |      |       |
| Lane Configuration            |                            |      |       |             |      |       |                |      |       |                |      |       |
| Turning Movement              | Left                       | Thru | Right | Left        | Thru | Right | Left           | Thru | Right | Left           | Thru | Right |
| Base Volume Input [veh/h]     | 124                        | 449  | 370   | 111         | 364  | 58    | 35             | 44   | 84    | 287            | 58   | 40    |
| Total Analysis Volume [veh/h] | 138                        | 499  | 206   | 119         | 391  | 31    | 43             | 54   | 52    | 299            | 60   | 21    |

## Intersection Settings

|                   |                              |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Cycle Length [s]  | 70                           |  |  |  |  |  |  |  |  |  |  |  |
| Active Pattern    | Pattern 1                    |  |  |  |  |  |  |  |  |  |  |  |
| Coordination Type | Time of Day Pattern Isolated |  |  |  |  |  |  |  |  |  |  |  |
| Actuation Type    | Fully actuated               |  |  |  |  |  |  |  |  |  |  |  |
| Lost time [s]     | 0.00                         |  |  |  |  |  |  |  |  |  |  |  |

## Phasing &amp; Timing (Basic)

|                            |          |         |         |         |         |         |         |         |         |         |         |         |
|----------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Control Type               | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss |
| Signal Group               | 1        | 6       | 0       | 0       | 2       | 0       | 3       | 8       | 0       | 7       | 4       | 0       |
| Auxiliary Signal Groups    |          |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]          | 5        | 60      | 0       | 0       | 60      | 0       | 5       | 45      | 0       | 5       | 45      | 0       |
| Amber [s]                  | 3.0      | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0     | 4.0     | 0.0     |
| All red [s]                | 1.0      | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0     | 2.0     | 0.0     |
| Walk [s]                   | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       |
| Pedestrian Clearance [s]   | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0       | 21      | 0       |
| Delayed Vehicle Green [s]  | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I1, Start-Up Lost Time [s] | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     |

## Phasing &amp; Timing: Pattern 1

|                   |      |    |   |   |    |   |      |    |   |      |    |   |
|-------------------|------|----|---|---|----|---|------|----|---|------|----|---|
| Split [s]         | 14   | 45 | 0 | 0 | 31 | 0 | 74   | 16 | 0 | 9    | 25 | 0 |
| Lead / Lag        | Lead | -  | - | - | -  | - | Lead | -  | - | Lead | -  | - |
| Minimum Green [s] | 5    | 10 | 0 | 0 | 10 | 0 | 5    | 10 | 0 | 5    | 10 | 0 |
| Minimum Recall    | No   | No |   |   | No |   |      | No |   | No   | No |   |
| Maximum Recall    | No   | No |   |   | No |   |      | No |   | No   | No |   |
| Pedestrian Recall | No   | No |   |   | No |   |      | No |   | No   | No |   |

## Exclusive Pedestrian Phase

|                          |   |  |  |  |  |  |  |  |  |  |  |  |
|--------------------------|---|--|--|--|--|--|--|--|--|--|--|--|
| Pedestrian Signal Group  | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Walk [s]      | 0 |  |  |  |  |  |  |  |  |  |  |  |
| Pedestrian Clearance [s] | 0 |  |  |  |  |  |  |  |  |  |  |  |

## Lane Group Calculations

|                                               |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| g / C, Green / Cycle                          | 0.10 | 0.55 | 0.55 | 0.39 | 0.39 | 0.39 | 0.14 | 0.14 | 0.14 | 0.26 | 0.26 | 0.26 |
| (v / s)_i Volume / Saturation Flow Rate       | 0.08 | 0.14 | 0.13 | 0.16 | 0.11 | 0.02 | 0.03 | 0.03 | 0.03 | 0.10 | 0.03 | 0.01 |
| so, Base Saturation Flow per Lane [pc/h/lane] | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Arrival type                                  | 3    |      |      | 3    |      |      | 3    |      |      | 3    |      |      |
| saturation flow rate [veh/h]                  | 4704 | 3500 | 4500 | 710  | 3500 | 4500 | 4347 | 4370 | 4500 | 3800 | 4370 | 4500 |

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| s, saturation flow rate [veh/min]     | 1781   | 3500  | 1569  | 143   | 3500  | 1569  | 1317  | 1670  | 1569  | 2003  | 1670  | 1569  |
|---------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| c, Capacity [veh/h]                   | 178    | 1959  | 875   | 314   | 1399  | 625   | 213   | 253   | 215   | 896   | 494   | 420   |
| X, volume / capacity                  | 0.77   | 0.25  | 0.24  | 0.38  | 0.28  | 0.05  | 0.20  | 0.21  | 0.24  | 0.33  | 0.12  | 0.05  |
| d, Delay for Lane Group [s/veh]       | 37.73  | 8.55  | 8.77  | 24.78 | 14.98 | 13.30 | 30.85 | 27.35 | 27.62 | 20.99 | 19.69 | 19.26 |
| Lane Group LOS                        | D      | A     | A     | C     | B     | B     | C     | C     | C     | C     | B     | B     |
| Critical Lane Group                   | Yes    | No    | No    | Yes   | No    | No    | No    | No    | Yes   | Yes   | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.37   | 1.45  | 1.27  | 1.70  | 1.80  | 0.27  | 0.68  | 0.79  | 0.77  | 1.86  | 0.71  | 0.24  |
| 50th-Percentile Queue Length [ft/ln]  | 59.15  | 36.37 | 31.77 | 42.47 | 45.00 | 6.78  | 17.03 | 19.78 | 19.28 | 46.52 | 17.74 | 6.10  |
| 95th-Percentile Queue Length [veh/ln] | 4.26   | 2.62  | 2.29  | 3.06  | 3.24  | 0.49  | 1.23  | 1.42  | 1.39  | 3.35  | 1.28  | 0.44  |
| 95th-Percentile Queue Length [ft/ln]  | 106.47 | 65.47 | 57.19 | 76.45 | 81.00 | 12.21 | 30.66 | 35.61 | 34.70 | 83.73 | 31.93 | 10.99 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 37.73 | 8.55 | 8.77 | 24.78 | 14.98 | 13.30 | 30.85 | 27.35 | 27.62 | 20.99 | 19.69 | 19.26 |
| Movement LOS                    | D     | A    | A    | C     | B     | B     | C     | C     | C     | C     | B     | B     |
| Critical Movement               | Yes   | No   | No   | No    | No    | No    | No    | No    | No    | No    | No    | No    |
| d_A, Approach Delay [s/veh]     | 13.38 |      |      | 17.04 |       |       | 28.45 |       |       | 20.69 |       |       |
| Approach LOS                    | B     |      |      | B     |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 17.04 |      |      |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.343 |      |      |       |       |       |       |       |       |       |       |       |

## **Appendix C – Trip Generation**

| PROJECT DETAILS  |                |                       |                      |
|------------------|----------------|-----------------------|----------------------|
| Project Name:    | Falcon Reserve | Type of Project:      |                      |
| Project No:      |                | City:                 | El Paso County       |
| Country:         | United States  | Built-up Area(Sq.ft): |                      |
| Analyst Name:    | Scott Barnhart | Clients Name:         | The Landhuis Company |
| Date:            | 3/23/2022      | ZIP/Postal Code:      |                      |
| State/Province:  | Colorado       | No. of Scenarios:     | 3                    |
| Analysis Region: |                |                       |                      |
| SCENARIO SUMMARY |                |                       |                      |

| Scenarios    | Name          | No. of Land Uses | Phases of Development | No. of Years to Project Traffic | User Group | Estimated New Vehicle Trips |      |       |
|--------------|---------------|------------------|-----------------------|---------------------------------|------------|-----------------------------|------|-------|
|              |               |                  |                       |                                 |            | Entry                       | Exit | Total |
| Scenario - 1 | Daily Traffic | 1                | 1                     | 0                               |            | 777                         | 777  | 1554  |
| Scenario - 2 | AM Peak Hour  | 1                | 1                     | 0                               |            | 30                          | 85   | 115   |
| Scenario - 3 | PM Peak Hour  | 1                | 1                     | 0                               |            | 97                          | 57   | 154   |

Scenario - 1

Scenario Name: Daily Traffic

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

| Land Use & Data Source                       | Location               | IV             | Size | Time Period | Method                       | Entry  | Exit   | Total |
|----------------------------------------------|------------------------|----------------|------|-------------|------------------------------|--------|--------|-------|
|                                              |                        |                |      |             | Rate/Equation                | Split% | Split% |       |
| 210 - Single-Family Detached Housing         | General Urban/Suburban | Dwelling Units | 160  | Weekday     | Best Fit (LOG)               | 777    | 777    | 1554  |
| Data Source: Trip Generation Manual, 11th Ed |                        |                |      |             | $\ln(T) = 0.92\ln(X) + 2.68$ | 50%    | 50%    |       |

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

| Land Use                             | Baseline Site Vehicle Mode Share |          | Baseline Site Vehicle Occupancy |      | Baseline Site Vehicle Directional Split |          |
|--------------------------------------|----------------------------------|----------|---------------------------------|------|-----------------------------------------|----------|
|                                      | Entry (%)                        | Exit (%) | Entry                           | Exit | Entry (%)                               | Exit (%) |
| 210 - Single-Family Detached Housing | 100                              | 100      | 1                               | 1    | 50                                      | 50       |

ESTIMATED BASELINE SITE PERSON TRIPS:

| Land Use                             | Person Trips by Vehicle |      | Person Trips by Other Modes |      | Total Baseline Site Person Trips |      |
|--------------------------------------|-------------------------|------|-----------------------------|------|----------------------------------|------|
|                                      | Entry                   | Exit | Entry                       | Exit | Entry                            | Exit |
| 210 - Single-Family Detached Housing | 777                     | 777  | 0                           | 0    | 777                              | 777  |
|                                      | 1554                    |      | 0                           |      | 1554                             |      |

NEW VEHICLE TRIPS

| Land Use                             | New Vehicle Trips |      |       |
|--------------------------------------|-------------------|------|-------|
|                                      | Entry             | Exit | Total |
| 210 - Single-Family Detached Housing | 777               | 777  | 1554  |

RESULTS

| Site Totals                    | Entry | Exit | Total |
|--------------------------------|-------|------|-------|
| Vehicle Trips Before Reduction | 777   | 777  | 1554  |
| External Vehicle Trips         | 777   | 777  | 1554  |
| New Vehicle Trips              | 777   | 777  | 1554  |

Scenario - 2

Scenario Name: AM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

| Land Use & Data Source                       | Location               | IV             | Size | Time Period                                    | Method                       | Entry  | Exit   | Total |
|----------------------------------------------|------------------------|----------------|------|------------------------------------------------|------------------------------|--------|--------|-------|
|                                              |                        |                |      |                                                | Rate/Equation                | Split% | Split% |       |
| 210 - Single-Family Detached Housing         | General Urban/Suburban | Dwelling Units | 160  | Weekday, Peak Hour of Adjacent Street Traffic, | Best Fit (LOG)               | 30     | 85     | 115   |
| Data Source: Trip Generation Manual, 11th Ed |                        |                |      |                                                | $\ln(T) = 0.91\ln(X) + 0.12$ | 26%    | 74%    |       |

VEHICLE TO PERSON TRIP CONVERSION

BASELINE SITE VEHICLE CHARACTERISTICS:

| Land Use                             | Baseline Site Vehicle Mode Share |          | Baseline Site Vehicle Occupancy |      | Baseline Site Vehicle Directional Split |          |
|--------------------------------------|----------------------------------|----------|---------------------------------|------|-----------------------------------------|----------|
|                                      | Entry (%)                        | Exit (%) | Entry                           | Exit | Entry (%)                               | Exit (%) |
| 210 - Single-Family Detached Housing | 100                              | 100      | 1                               | 1    | 26                                      | 74       |

ESTIMATED BASELINE SITE PERSON TRIPS:

| Land Use                             | Person Trips by Vehicle |      | Person Trips by Other Modes |      | Total Baseline Site Person Trips |      |
|--------------------------------------|-------------------------|------|-----------------------------|------|----------------------------------|------|
|                                      | Entry                   | Exit | Entry                       | Exit | Entry                            | Exit |
| 210 - Single-Family Detached Housing | 30                      | 85   | 0                           | 0    | 30                               | 85   |
|                                      | 115                     |      | 0                           |      | 115                              |      |

NEW VEHICLE TRIPS

| Land Use                             | New Vehicle Trips |      |       |
|--------------------------------------|-------------------|------|-------|
|                                      | Entry             | Exit | Total |
| 210 - Single-Family Detached Housing | 30                | 85   | 115   |

RESULTS

| Site Totals                    | Entry | Exit | Total |
|--------------------------------|-------|------|-------|
| Vehicle Trips Before Reduction | 30    | 85   | 115   |
| External Vehicle Trips         | 30    | 85   | 115   |
| New Vehicle Trips              | 30    | 85   | 115   |

Scenario - 3

Scenario Name: PM Peak Hour

User Group:

Dev. phase: 1

No. of Years to Project 0

Analyst Note:

Traffic :

Warning:

VEHICLE TRIPS BEFORE REDUCTION

| Land Use & Data Source                       | Location               | IV             | Size | Time Period                                    | Method                       | Entry  | Exit   | Total |
|----------------------------------------------|------------------------|----------------|------|------------------------------------------------|------------------------------|--------|--------|-------|
|                                              |                        |                |      |                                                | Rate/Equation                | Split% | Split% |       |
| 210 - Single-Family Detached Housing         | General Urban/Suburban | Dwelling Units | 160  | Weekday, Peak Hour of Adjacent Street Traffic, | Best Fit (LOG)               | 97     | 57     | 154   |
| Data Source: Trip Generation Manual, 11th Ed |                        |                |      |                                                | $\ln(T) = 0.94\ln(X) + 0.27$ | 63%    | 37%    |       |

VEHICLE TO PERSON TRIP CONVERSION

**BASELINE SITE VEHICLE CHARACTERISTICS:**

| Land Use                             | Baseline Site Vehicle Mode Share |          | Baseline Site Vehicle Occupancy |      | Baseline Site Vehicle Directional Split |          |
|--------------------------------------|----------------------------------|----------|---------------------------------|------|-----------------------------------------|----------|
|                                      | Entry (%)                        | Exit (%) | Entry                           | Exit | Entry (%)                               | Exit (%) |
| 210 - Single-Family Detached Housing | 100                              | 100      | 1                               | 1    | 63                                      | 37       |

**ESTIMATED BASELINE SITE PERSON TRIPS:**

| Land Use                             | Person Trips by Vehicle |      | Person Trips by Other Modes |      | Total Baseline Site Person Trips |      |
|--------------------------------------|-------------------------|------|-----------------------------|------|----------------------------------|------|
|                                      | Entry                   | Exit | Entry                       | Exit | Entry                            | Exit |
| 210 - Single-Family Detached Housing | 97                      | 57   | 0                           | 0    | 97                               | 57   |
|                                      | 154                     |      | 0                           |      | 154                              |      |

NEW VEHICLE TRIPS

| Land Use                             | New Vehicle Trips |      |       |
|--------------------------------------|-------------------|------|-------|
|                                      | Entry             | Exit | Total |
| 210 - Single-Family Detached Housing | 97                | 57   | 154   |

RESULTS

| Site Totals                    | Entry | Exit | Total |
|--------------------------------|-------|------|-------|
| Vehicle Trips Before Reduction | 97    | 57   | 154   |
| External Vehicle Trips         | 97    | 57   | 154   |
| New Vehicle Trips              | 97    | 57   | 154   |

## **Appendix D – Buildout Year Conditions Analyses**

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 33.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.671 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 157         | 346    | 141    | 110         | 980    | 9      | 15           | 75     | 252    | 350          | 145    | 155    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 80     | 0           | 0      | 5      | 0            | 0      | 142    | 0            | 0      | 88     |
| Total Hourly Volume [veh/h]                 | 177         | 390    | 79     | 124         | 1105   | 5      | 17           | 85     | 142    | 395          | 164    | 87     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 52          | 115    | 23     | 36          | 325    | 1      | 5            | 25     | 42     | 116          | 48     | 26     |
| Total Analysis Volume [veh/h]               | 208         | 459    | 93     | 146         | 1300   | 6      | 20           | 100    | 167    | 465          | 193    | 102    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 100                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1       | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 20      | 70      | 0       | 20      | 70      | 0       | 5       | 40      | 0       | 5        | 40      | 0       |
| Amber [s]                       | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 1.0     | 3.0     | 0.0     | 1.0      | 3.0     | 0.0     |
| Walk [s]                        | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]        | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0        | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0     | 5.5     | 0.0     | 5.0     | 5.5     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0      | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 12   | 18  | 0   | 12   | 18  | 0   | 9    | 51  | 0   | 19   | 61  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
| L, Total Lost Time per Cycle [s]        | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.00  | 7.00  | 7.00  | 4.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 5.50  | 5.50  | 0.00  | 5.50  | 5.50  | 0.00  | 5.00  | 5.00  | 2.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 54    | 42    | 42    | 54    | 42    | 42    | 32    | 13    | 13    | 15    | 26    | 26    |
| g / C, Green / Cycle                    | 0.54  | 0.42  | 0.42  | 0.54  | 0.42  | 0.42  | 0.32  | 0.13  | 0.13  | 0.15  | 0.26  | 0.26  |
| (v / s)_i Volume / Saturation Flow Rate | 0.31  | 0.13  | 0.06  | 0.14  | 0.37  | 0.00  | 0.02  | 0.05  | 0.11  | 0.13  | 0.10  | 0.06  |
| s, saturation flow rate [veh/h]         | 675   | 3560  | 1589  | 1029  | 3560  | 1589  | 1174  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 325   | 1478  | 660   | 577   | 1478  | 660   | 399   | 243   | 207   | 519   | 483   | 411   |
| d1, Uniform Delay [s]                   | 20.83 | 19.64 | 18.17 | 12.32 | 26.95 | 17.18 | 23.69 | 39.98 | 42.29 | 41.74 | 30.66 | 29.38 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 9.33  | 0.55  | 0.45  | 1.06  | 7.79  | 0.03  | 0.05  | 1.11  | 7.31  | 5.77  | 0.53  | 0.31  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |       |       |        |        |        |        |       |
|---------------------------------------|--------|--------|-------|-------|--------|-------|-------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.64   | 0.31   | 0.14  | 0.25  | 0.88   | 0.01  | 0.05  | 0.41   | 0.81   | 0.90   | 0.40   | 0.25  |
| d, Delay for Lane Group [s/veh]       | 30.16  | 20.19  | 18.62 | 13.38 | 34.75  | 17.20 | 23.75 | 41.10  | 49.60  | 47.50  | 31.19  | 29.69 |
| Lane Group LOS                        | C      | C      | B     | B     | C      | B     | C     | D      | D      | D      | C      | C     |
| Critical Lane Group                   | Yes    | No     | No    | No    | Yes    | No    | No    | No     | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.93   | 3.33   | 1.29  | 1.58  | 14.10  | 0.08  | 0.32  | 2.25   | 4.27   | 5.80   | 3.74   | 1.89  |
| 50th-Percentile Queue Length [ft/ln]  | 73.32  | 83.25  | 32.21 | 39.53 | 352.59 | 1.95  | 7.90  | 56.34  | 106.68 | 145.01 | 93.51  | 47.34 |
| 95th-Percentile Queue Length [veh/ln] | 5.28   | 5.99   | 2.32  | 2.85  | 20.26  | 0.14  | 0.57  | 4.06   | 7.65   | 9.75   | 6.73   | 3.41  |
| 95th-Percentile Queue Length [ft/ln]  | 131.98 | 149.86 | 57.98 | 71.16 | 506.56 | 3.52  | 14.22 | 101.40 | 191.37 | 243.75 | 168.31 | 85.21 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 30.16 | 20.19 | 18.62 | 13.38 | 34.75 | 17.20 | 23.75 | 41.10 | 49.60 | 47.50 | 31.19 | 29.69 |
| Movement LOS                    | C     | C     | B     | B     | C     | B     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 22.73 |       |       | 32.53 |       |       | 44.84 |       |       | 40.97 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 33.29 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.671 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

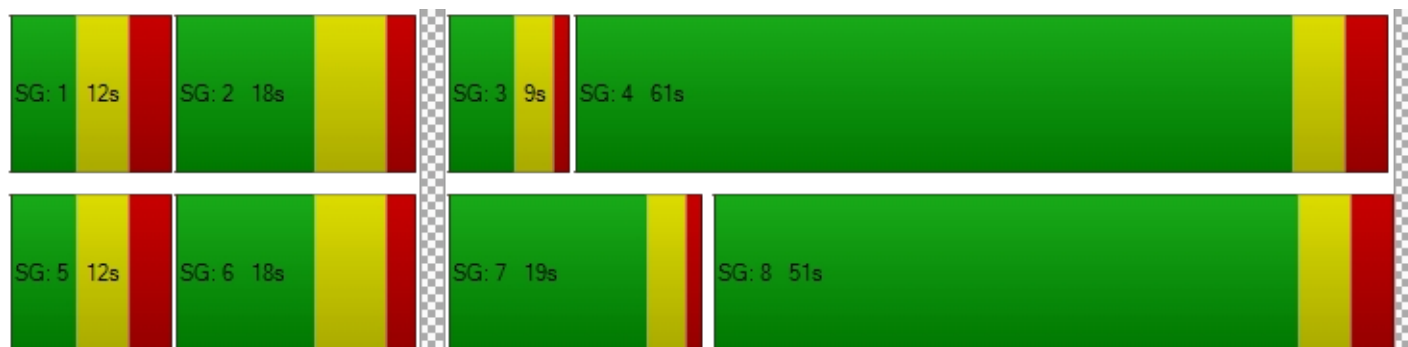
|                              |        |        |        |        |         |      |       |        |        |        |        |        |
|------------------------------|--------|--------|--------|--------|---------|------|-------|--------|--------|--------|--------|--------|
| Vehicle Miles Traveled [mph] | 85.03  | 187.65 | 38.02  | 14.25  | 126.91  | 0.59 | 1.97  | 9.84   | 16.43  | 97.10  | 40.30  | 21.30  |
| Stops [stops/h]              | 105.59 | 239.77 | 46.38  | 56.92  | 1015.45 | 2.81 | 11.38 | 81.12  | 153.61 | 417.62 | 134.65 | 68.17  |
| Fuel consumption [US gal/h]  | 6.08   | 12.62  | 2.49   | 1.93   | 32.30   | 0.09 | 0.31  | 2.18   | 4.16   | 13.02  | 4.28   | 2.19   |
| CO [g/h]                     | 425.14 | 881.92 | 173.76 | 135.02 | 2257.67 | 6.49 | 21.36 | 152.53 | 290.69 | 909.79 | 299.21 | 153.36 |
| NOx [g/h]                    | 82.72  | 171.59 | 33.81  | 26.27  | 439.26  | 1.26 | 4.16  | 29.68  | 56.56  | 177.01 | 58.22  | 29.84  |
| VOC [g/h]                    | 98.53  | 204.39 | 40.27  | 31.29  | 523.24  | 1.50 | 4.95  | 35.35  | 67.37  | 210.85 | 69.35  | 35.54  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | F     |  |  | F     |  |  | F     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 210   |  |  | 210   |  |  | 880   |  |  | 1080  |  |  |
| d_b, Bicycle Delay [s]                                   | 40.05 |  |  | 40.05 |  |  | 15.68 |  |  | 10.58 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.253 |  |  | 2.762 |  |  | 2.267 |  |  | 2.959 |  |  |
| Bicycle LOS                                              | B     |  |  | C     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 27.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.489 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 98          | 328    | 109    | 70          | 411    | 57     | 102            | 131    | 263    | 397            | 176    | 169    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 62     | 0           | 0      | 32     | 0              | 0      | 149    | 0              | 0      | 96     |
| Total Hourly Volume [veh/h]                 | 111         | 370    | 61     | 79          | 464    | 32     | 115            | 148    | 148    | 448            | 199    | 95     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 33          | 109    | 18     | 23          | 136    | 9      | 34             | 44     | 44     | 132            | 59     | 28     |
| Total Analysis Volume [veh/h]               | 131         | 435    | 72     | 93          | 546    | 38     | 135            | 174    | 174    | 527            | 234    | 112    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 80                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 0       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 0       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |     |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 16   | 46  | 0   | 0   | 30  | 0   | 15   | 17  | 0   | 17   | 19  | 0   |
| Lead / Lag            | Lead | -   | -   | -   | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 0   | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 7     | 39    | 39    | 28    | 28    | 28    | 28    | 11    | 11    | 13    | 17    | 17    |
| g / C, Green / Cycle                    | 0.09  | 0.49  | 0.49  | 0.35  | 0.35  | 0.35  | 0.35  | 0.13  | 0.13  | 0.16  | 0.22  | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.07  | 0.12  | 0.05  | 0.10  | 0.15  | 0.02  | 0.11  | 0.09  | 0.11  | 0.15  | 0.13  | 0.07  |
| s, saturation flow rate [veh/h]         | 1781  | 3560  | 1589  | 892   | 3560  | 1589  | 1257  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 167   | 1753  | 783   | 311   | 1240  | 554   | 447   | 248   | 211   | 562   | 406   | 345   |
| d1, Uniform Delay [s]                   | 35.44 | 11.74 | 10.80 | 25.24 | 20.06 | 17.40 | 19.20 | 33.18 | 33.79 | 33.10 | 28.01 | 26.36 |
| k, delay calibration                    | 0.11  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.23  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 7.75  | 0.34  | 0.23  | 2.44  | 1.14  | 0.24  | 0.82  | 3.59  | 7.91  | 8.08  | 1.29  | 0.54  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |       |       |        |       |       |        |        |        |        |       |
|---------------------------------------|--------|-------|-------|-------|--------|-------|-------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.78   | 0.25  | 0.09  | 0.30  | 0.44   | 0.07  | 0.30  | 0.70   | 0.83   | 0.94   | 0.58   | 0.32  |
| d, Delay for Lane Group [s/veh]       | 43.19  | 12.08 | 11.03 | 27.68 | 21.20  | 17.64 | 20.01 | 36.77  | 41.70  | 41.18  | 29.30  | 26.90 |
| Lane Group LOS                        | D      | B     | B     | C     | C      | B     | C     | D      | D      | D      | C      | C     |
| Critical Lane Group                   | Yes    | No    | No    | No    | Yes    | No    | No    | No     | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.64   | 1.88  | 0.60  | 1.53  | 3.56   | 0.44  | 1.77  | 3.35   | 3.62   | 5.45   | 3.96   | 1.77  |
| 50th-Percentile Queue Length [ft/ln]  | 66.02  | 47.03 | 14.95 | 38.17 | 89.09  | 11.09 | 44.32 | 83.71  | 90.55  | 136.24 | 99.02  | 44.26 |
| 95th-Percentile Queue Length [veh/ln] | 4.75   | 3.39  | 1.08  | 2.75  | 6.41   | 0.80  | 3.19  | 6.03   | 6.52   | 9.28   | 7.13   | 3.19  |
| 95th-Percentile Queue Length [ft/ln]  | 118.84 | 84.65 | 26.91 | 68.71 | 160.36 | 19.95 | 79.77 | 150.68 | 162.98 | 231.95 | 178.23 | 79.67 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 43.19 | 12.08 | 11.03 | 27.68 | 21.20 | 17.64 | 20.01 | 36.77 | 41.70 | 41.18 | 29.30 | 26.90 |
| Movement LOS                    | D     | B     | B     | C     | C     | B     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 18.35 |       |       | 21.89 |       |       | 33.86 |       |       | 36.17 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 27.88 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.489 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

|                              |        |        |        |        |        |       |        |        |        |        |        |        |
|------------------------------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|
| Vehicle Miles Traveled [mph] | 43.06  | 142.98 | 23.67  | 23.08  | 135.48 | 9.43  | 44.26  | 57.05  | 57.05  | 80.37  | 35.69  | 17.08  |
| Stops [stops/h]              | 118.84 | 169.30 | 26.91  | 68.71  | 320.72 | 19.95 | 79.77  | 150.68 | 162.98 | 490.46 | 178.23 | 79.67  |
| Fuel consumption [US gal/h]  | 4.80   | 9.00   | 1.45   | 2.57   | 12.84  | 0.82  | 2.84   | 4.61   | 4.88   | 11.17  | 4.10   | 1.86   |
| CO [g/h]                     | 335.46 | 628.90 | 101.58 | 179.79 | 897.84 | 57.49 | 198.30 | 322.21 | 340.90 | 780.69 | 286.32 | 130.25 |
| NOx [g/h]                    | 65.27  | 122.36 | 19.76  | 34.98  | 174.69 | 11.19 | 38.58  | 62.69  | 66.33  | 151.89 | 55.71  | 25.34  |
| VOC [g/h]                    | 77.75  | 145.75 | 23.54  | 41.67  | 208.08 | 13.32 | 45.96  | 74.68  | 79.01  | 180.93 | 66.36  | 30.19  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 31.51 |  |  | 31.51 |  |  | 31.51 |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.161 |  |  | 2.984 |  |  | 2.642 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | C     |  |  | C     |  |  | B     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 975   |  |  | 575   |  |  | 275   |  |  | 325   |  |  |
| d_b, Bicycle Delay [s]                                   | 10.51 |  |  | 20.31 |  |  | 29.76 |  |  | 28.06 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.137 |  |  | 2.145 |  |  | 2.602 |  |  | 3.158 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 20.4  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.037 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 7                | 6      | 489            | 15     | 4              | 300    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280         | 1.1280 | 1.1280         | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0              | 0      | 0              | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 8                | 7      | 552            | 17     | 5              | 338    |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500         | 0.8500 | 0.8500         | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2                | 2      | 162            | 5      | 1              | 99     |
| Total Analysis Volume [veh/h]           | 9                | 8      | 649            | 20     | 6              | 398    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.04  | 0.02  | 0.01 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 20.44 | 13.42 | 0.00 | 0.00 | 8.93 | 0.00 |
| Movement LOS                          | C     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.17  | 0.17  | 0.00 | 0.00 | 0.02 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 4.28  | 4.28  | 0.00 | 0.00 | 0.49 | 0.00 |
| d_A, Approach Delay [s/veh]           | 17.14 |       | 0.00 |      | 0.13 |      |
| Approach LOS                          | C     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.32  |       |      |      |      |      |
| Intersection LOS                      | C     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 16.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.126 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Stapleton Dr                                                                       |        | Stapleton Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Southbound                                                                        |        | Eastbound                                                                          |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Left                                                                               | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                              | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                             | 100.00 | 100.00                                                                              | 115.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                  | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                               | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 45.00                                                                              |        | 45.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                               |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|-----------------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 35               | 17     | 0            | 293    | 294          | 13     |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00         | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280       | 1.1280 | 1.1280       | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0            | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0            | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0            | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0            | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0            | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0            | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 39               | 19     | 0            | 331    | 332          | 15     |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500       | 0.8500 | 0.8500       | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 11               | 6      | 0            | 97     | 98           | 4      |
| Total Analysis Volume [veh/h]           | 46               | 22     | 0            | 389    | 391          | 18     |
| Pedestrian Volume [ped/h]               | 0                |        | 0            |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.13  | 0.03  | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 16.32 | 10.66 | 8.13 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          | C     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.43  | 0.10  | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 10.74 | 2.59  | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 14.49 |       | 0.00 |      | 0.00 |      |
| Approach LOS                          | B     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.14  |       |      |      |      |      |
| Intersection LOS                      | C     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 8.6   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.009 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Southbound                                                                          |        | Waterbury Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 30.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Southbound |        | Waterbury Dr |        |
|-----------------------------------------|------------------|--------|------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 7                | 13     | 41         | 0      | 0            | 7      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00       | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280     | 1.1280 | 1.1280       | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0          | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0          | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0          | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0          | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0          | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0          | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 8                | 15     | 46         | 0      | 0            | 8      |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500     | 0.8500 | 0.8500       | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2                | 4      | 14         | 0      | 0            | 2      |
| Total Analysis Volume [veh/h]           | 9                | 18     | 54         | 0      | 0            | 9      |
| Pedestrian Volume [ped/h]               | 0                |        | 0          |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.33 | 0.00 | 0.00 | 0.00 | 9.01 | 8.59 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.00 | 0.00 | 0.03 | 0.03 |
| 95th-Percentile Queue Length [ft/ln]  | 0.38 | 0.38 | 0.00 | 0.00 | 0.67 | 0.67 |
| d_A, Approach Delay [s/veh]           | 2.44 |      | 0.00 |      | 8.59 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.59 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 8.9   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.001 |

#### Intersection Setup

| Name                         |                                                                                   |        | Liberty Grove Dr                                                                    |        | Salem Ct                                                                            |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 25.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    |        |        | Liberty Grove Dr |        | Salem Ct |        |
|-----------------------------------------|--------|--------|------------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 3      | 10     | 34               | 1      | 1        | 6      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00             | 2.00   | 2.00     | 2.00   |
| Growth Factor                           | 1.1280 | 1.1280 | 1.1280           | 1.1280 | 1.1280   | 1.1280 |
| In-Process Volume [veh/h]               | 0      | 0      | 0                | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0                | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0                | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0                | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0                | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0                | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 3      | 11     | 38               | 1      | 1        | 7      |
| Peak Hour Factor                        | 0.8500 | 0.8500 | 0.8500           | 0.8500 | 0.8500   | 0.8500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 3      | 11               | 0      | 0        | 2      |
| Total Analysis Volume [veh/h]           | 4      | 13     | 45               | 1      | 1        | 8      |
| Pedestrian Volume [ped/h]               | 0      |        | 0                |        | 0        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.31 | 0.00 | 0.00 | 0.00 | 8.88 | 8.55 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.01 | 0.01 | 0.00 | 0.00 | 0.03 | 0.03 |
| 95th-Percentile Queue Length [ft/ln]  | 0.17 | 0.17 | 0.00 | 0.00 | 0.67 | 0.67 |
| d_A, Approach Delay [s/veh]           | 1.72 |      | 0.00 |      | 8.58 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.48 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 343           | 569 | 15            |
| 2    | 333           | 552 | 15            |
| 3    | 326           | 541 | 14            |
| 4    | 305           | 506 | 13            |
| 5    | 271           | 450 | 12            |
| 6    | 268           | 444 | 12            |
| 7    | 264           | 438 | 12            |
| 8    | 240           | 398 | 11            |
| 9    | 237           | 393 | 10            |
| 10   | 233           | 387 | 10            |
| 11   | 202           | 336 | 9             |
| 12   | 189           | 313 | 8             |
| 13   | 185           | 307 | 8             |
| 14   | 137           | 228 | 6             |
| 15   | 137           | 228 | 6             |
| 16   | 96            | 159 | 4             |
| 17   | 55            | 91  | 2             |
| 18   | 55            | 91  | 2             |
| 19   | 31            | 51  | 1             |
| 20   | 17            | 28  | 1             |
| 21   | 10            | 17  | 0             |
| 22   | 3             | 6   | 0             |
| 23   | 3             | 6   | 0             |
| 24   | 3             | 6   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 912    | 1            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 885    | 1            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 867    | 1            | 14     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 811    | 1            | 13     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 721    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 712    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 702    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 638    | 1            | 11     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 630    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 620    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 538    | 1            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 502    | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 492    | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 365    | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 365    | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 255    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 146    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 146    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 82     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 45     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 27     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 9      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 9      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 9      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 17.1      |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 15        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 927       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | N    |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | N             |
| 1    | 347           | 331 | 58            |
| 2    | 337           | 321 | 56            |
| 3    | 330           | 314 | 55            |
| 4    | 309           | 295 | 52            |
| 5    | 274           | 261 | 46            |
| 6    | 271           | 258 | 45            |
| 7    | 267           | 255 | 45            |
| 8    | 243           | 232 | 41            |
| 9    | 239           | 228 | 40            |
| 10   | 236           | 225 | 39            |
| 11   | 205           | 195 | 34            |
| 12   | 191           | 182 | 32            |
| 13   | 187           | 179 | 31            |
| 14   | 139           | 132 | 23            |
| 15   | 139           | 132 | 23            |
| 16   | 97            | 93  | 16            |
| 17   | 56            | 53  | 9             |
| 18   | 56            | 53  | 9             |
| 19   | 31            | 30  | 5             |
| 20   | 17            | 17  | 3             |
| 21   | 10            | 10  | 2             |
| 22   | 3             | 3   | 1             |
| 23   | 3             | 3   | 1             |
| 24   | 3             | 3   | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 678    | 2            | 58     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 2         | 2             | 658    | 2            | 56     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 3         | 2             | 644    | 2            | 55     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 604    | 2            | 52     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 535    | 2            | 46     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 529    | 2            | 45     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 522    | 2            | 45     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 475    | 2            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 467    | 2            | 40     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 461    | 2            | 39     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 400    | 2            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 373    | 2            | 32     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 366    | 2            | 31     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 271    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 271    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 190    | 2            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 109    | 2            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 109    | 2            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 61     | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 34     | 2            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 20     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 2   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | N         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 14.5      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:14      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 58        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 736       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 23            | 46 | 8             |
| 2    | 22            | 45 | 8             |
| 3    | 22            | 44 | 8             |
| 4    | 20            | 41 | 7             |
| 5    | 18            | 36 | 6             |
| 6    | 18            | 36 | 6             |
| 7    | 18            | 35 | 6             |
| 8    | 16            | 32 | 6             |
| 9    | 16            | 32 | 6             |
| 10   | 16            | 31 | 5             |
| 11   | 14            | 27 | 5             |
| 12   | 13            | 25 | 4             |
| 13   | 12            | 25 | 4             |
| 14   | 9             | 18 | 3             |
| 15   | 9             | 18 | 3             |
| 16   | 6             | 13 | 2             |
| 17   | 4             | 7  | 1             |
| 18   | 4             | 7  | 1             |
| 19   | 2             | 4  | 1             |
| 20   | 1             | 2  | 0             |
| 21   | 1             | 1  | 0             |
| 22   | 0             | 0  | 0             |
| 23   | 0             | 0  | 0             |
| 24   | 0             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 69     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 67     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 66     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 61     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 54     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 54     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 53     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 48     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 48     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 47     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 41     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 38     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 37     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 27     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 27     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 19     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 11     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 11     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 6      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.6       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 8         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 77        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 14            | 39 | 8             |
| 2    | 14            | 38 | 8             |
| 3    | 13            | 37 | 8             |
| 4    | 12            | 35 | 7             |
| 5    | 11            | 31 | 6             |
| 6    | 11            | 30 | 6             |
| 7    | 11            | 30 | 6             |
| 8    | 10            | 27 | 6             |
| 9    | 10            | 27 | 6             |
| 10   | 10            | 27 | 5             |
| 11   | 8             | 23 | 5             |
| 12   | 8             | 21 | 4             |
| 13   | 8             | 21 | 4             |
| 14   | 6             | 16 | 3             |
| 15   | 6             | 16 | 3             |
| 16   | 4             | 11 | 2             |
| 17   | 2             | 6  | 1             |
| 18   | 2             | 6  | 1             |
| 19   | 1             | 4  | 1             |
| 20   | 1             | 2  | 0             |
| 21   | 0             | 1  | 0             |
| 22   | 0             | 0  | 0             |
| 23   | 0             | 0  | 0             |
| 24   | 0             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 53     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 52     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 50     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 47     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 42     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 41     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 41     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 37     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 37     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 37     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 31     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 29     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 29     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 22     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 22     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 15     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 8      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 8      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 5      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.6       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 8         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 61        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 25.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.546 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 231         | 954    | 386    | 87          | 570    | 9      | 10           | 35     | 131    | 280          | 42     | 70     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 218    | 0           | 0      | 5      | 0            | 0      | 74     | 0            | 0      | 40     |
| Total Hourly Volume [veh/h]                 | 261         | 1076   | 217    | 98          | 643    | 5      | 11           | 39     | 74     | 316          | 47     | 39     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 77          | 316    | 64     | 29          | 189    | 1      | 3            | 11     | 22     | 93           | 14     | 11     |
| Total Analysis Volume [veh/h]               | 307         | 1266   | 255    | 115         | 756    | 6      | 13           | 46     | 87     | 372          | 55     | 46     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 120                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1       | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 20      | 70      | 0       | 20      | 70      | 0       | 5       | 40      | 0       | 5        | 40      | 0       |
| Amber [s]                       | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 1.0     | 3.0     | 0.0     | 1.0      | 3.0     | 0.0     |
| Walk [s]                        | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]        | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0        | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0     | 5.5     | 0.0     | 5.0     | 5.5     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0      | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 12   | 18  | 0   | 12   | 18  | 0   | 9    | 71  | 0   | 19   | 81  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   | 120   |
| L, Total Lost Time per Cycle [s]        | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.50  | 7.00  | 7.00  | 7.00  | 4.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 0.00  | 5.50  | 5.50  | 0.00  | 5.50  | 5.50  | 0.00  | 5.00  | 5.00  | 2.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 77    | 65    | 65    | 77    | 65    | 65    | 29    | 10    | 10    | 15    | 23    | 23    |
| g / C, Green / Cycle                    | 0.64  | 0.54  | 0.54  | 0.64  | 0.54  | 0.54  | 0.24  | 0.08  | 0.08  | 0.12  | 0.19  | 0.19  |
| (v / s)_i Volume / Saturation Flow Rate | 0.36  | 0.36  | 0.16  | 0.22  | 0.21  | 0.00  | 0.01  | 0.02  | 0.05  | 0.11  | 0.03  | 0.03  |
| s, saturation flow rate [veh/h]         | 844   | 3560  | 1589  | 528   | 3560  | 1589  | 1357  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 539   | 1925  | 859   | 339   | 1922  | 858   | 387   | 156   | 132   | 425   | 358   | 304   |
| d1, Uniform Delay [s]                   | 11.19 | 19.65 | 15.08 | 14.44 | 16.13 | 12.75 | 35.00 | 51.70 | 53.35 | 51.74 | 40.43 | 40.41 |
| k, delay calibration                    | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 4.33  | 1.78  | 0.88  | 2.71  | 0.61  | 0.01  | 0.03  | 1.05  | 5.46  | 5.87  | 0.20  | 0.23  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |       |        |       |       |       |        |        |       |       |
|---------------------------------------|--------|--------|--------|-------|--------|-------|-------|-------|--------|--------|-------|-------|
| X, volume / capacity                  | 0.57   | 0.66   | 0.30   | 0.34  | 0.39   | 0.01  | 0.03  | 0.30  | 0.66   | 0.88   | 0.15  | 0.15  |
| d, Delay for Lane Group [s/veh]       | 15.52  | 21.43  | 15.96  | 17.15 | 16.73  | 12.77 | 35.04 | 52.75 | 58.80  | 57.61  | 40.63 | 40.64 |
| Lane Group LOS                        | B      | C      | B      | B     | B      | B     | D     | D     | E      | E      | D     | D     |
| Critical Lane Group                   | No     | Yes    | No     | Yes   | No     | No    | No    | No    | Yes    | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.60   | 11.55  | 3.63   | 1.23  | 5.59   | 0.07  | 0.29  | 1.32  | 2.69   | 5.70   | 1.35  | 1.13  |
| 50th-Percentile Queue Length [ft/ln]  | 90.10  | 288.75 | 90.87  | 30.87 | 139.65 | 1.79  | 7.23  | 32.97 | 67.16  | 142.43 | 33.65 | 28.20 |
| 95th-Percentile Queue Length [veh/ln] | 6.49   | 17.12  | 6.54   | 2.22  | 9.46   | 0.13  | 0.52  | 2.37  | 4.84   | 9.61   | 2.42  | 2.03  |
| 95th-Percentile Queue Length [ft/ln]  | 162.19 | 428.09 | 163.57 | 55.56 | 236.55 | 3.22  | 13.02 | 59.35 | 120.88 | 240.30 | 60.57 | 50.76 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 15.52 | 21.43 | 15.96 | 17.15 | 16.73 | 12.77 | 35.04 | 52.75 | 58.80 | 57.61 | 40.63 | 40.64 |
| Movement LOS                    | B     | C     | B     | B     | B     | B     | D     | D     | E     | E     | D     | D     |
| d_A, Approach Delay [s/veh]     | 19.67 |       |       | 16.76 |       |       | 54.78 |       |       | 53.98 |       |       |
| Approach LOS                    | B     |       |       | B     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 25.33 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.546 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

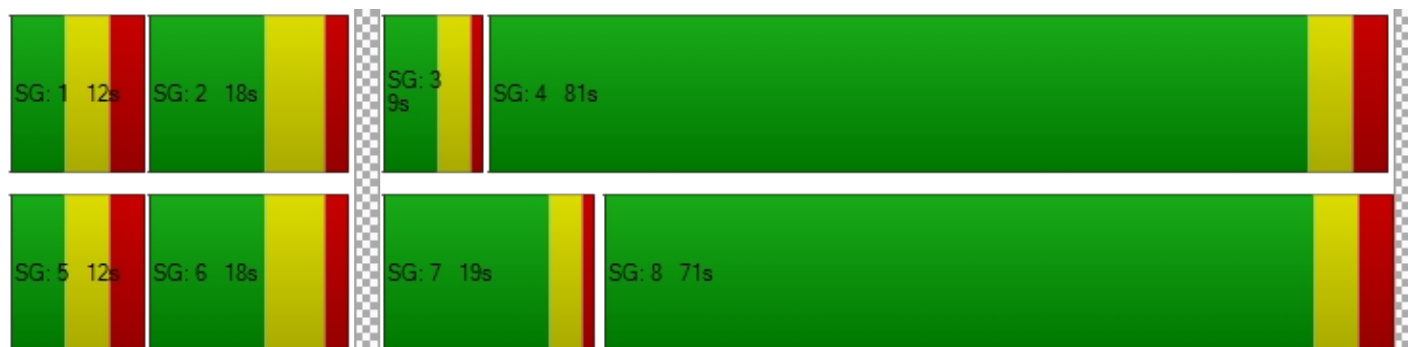
|                              |        |         |        |        |        |      |       |       |        |        |       |       |
|------------------------------|--------|---------|--------|--------|--------|------|-------|-------|--------|--------|-------|-------|
| Vehicle Miles Traveled [mph] | 125.51 | 517.57  | 104.25 | 11.23  | 73.80  | 0.59 | 1.28  | 4.53  | 8.56   | 77.68  | 11.48 | 9.61  |
| Stops [stops/h]              | 108.13 | 693.01  | 109.05 | 37.04  | 335.15 | 2.15 | 8.68  | 39.57 | 80.59  | 341.84 | 40.38 | 33.84 |
| Fuel consumption [US gal/h]  | 7.18   | 35.71   | 6.34   | 1.46   | 11.27  | 0.08 | 0.24  | 1.14  | 2.34   | 11.27  | 1.35  | 1.13  |
| CO [g/h]                     | 501.63 | 2495.83 | 443.25 | 102.39 | 787.67 | 5.25 | 17.09 | 79.74 | 163.31 | 788.00 | 94.39 | 79.01 |
| NOx [g/h]                    | 97.60  | 485.60  | 86.24  | 19.92  | 153.25 | 1.02 | 3.32  | 15.51 | 31.77  | 153.32 | 18.37 | 15.37 |
| VOC [g/h]                    | 116.26 | 578.43  | 102.73 | 23.73  | 182.55 | 1.22 | 3.96  | 18.48 | 37.85  | 182.63 | 21.88 | 18.31 |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | F     |  |  | F     |  |  | F     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 175   |  |  | 175   |  |  | 1067  |  |  | 1233  |  |  |
| d_b, Bicycle Delay [s]                                   | 49.96 |  |  | 49.96 |  |  | 13.07 |  |  | 8.82  |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 3.248 |  |  | 2.287 |  |  | 1.923 |  |  | 2.406 |  |  |
| Bicycle LOS                                              | C     |  |  | B     |  |  | A     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 23.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.462 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 124         | 449    | 370    | 111         | 364    | 58     | 35             | 44     | 84     | 287            | 58     | 40     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 209    | 0           | 0      | 33     | 0              | 0      | 48     | 0              | 0      | 23     |
| Total Hourly Volume [veh/h]                 | 140         | 506    | 208    | 125         | 411    | 32     | 39             | 50     | 47     | 324            | 65     | 22     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 41          | 149    | 61     | 37          | 121    | 9      | 11             | 15     | 14     | 95             | 19     | 6      |
| Total Analysis Volume [veh/h]               | 165         | 595    | 245    | 147         | 484    | 38     | 46             | 59     | 55     | 381            | 76     | 26     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 80                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 0       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 0       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |     |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 20   | 50  | 0   | 0   | 30  | 0   | 9    | 16  | 0   | 14   | 21  | 0   |
| Lead / Lag            | Lead | -   | -   | -   | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 0   | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | R    | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 80    | 80   | 80   | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00 | 7.00 | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 9     | 44   | 44   | 31    | 31    | 31    | 23    | 9     | 9     | 10    | 16    | 16    |
| g / C, Green / Cycle                    | 0.12  | 0.55 | 0.55 | 0.38  | 0.38  | 0.38  | 0.29  | 0.12  | 0.12  | 0.13  | 0.20  | 0.20  |
| (v / s)_i Volume / Saturation Flow Rate | 0.09  | 0.17 | 0.15 | 0.22  | 0.14  | 0.02  | 0.03  | 0.03  | 0.03  | 0.11  | 0.04  | 0.02  |
| s, saturation flow rate [veh/h]         | 1781  | 3560 | 1589 | 655   | 3560  | 1589  | 1403  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 207   | 1948 | 870  | 259   | 1356  | 605   | 497   | 216   | 183   | 432   | 373   | 317   |
| d1, Uniform Delay [s]                   | 34.44 | 9.85 | 9.70 | 28.40 | 17.74 | 15.70 | 20.73 | 32.32 | 32.42 | 34.42 | 26.71 | 26.05 |
| k, delay calibration                    | 0.11  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 6.88  | 0.41 | 0.81 | 8.74  | 0.73  | 0.20  | 0.08  | 0.68  | 0.91  | 6.00  | 0.27  | 0.11  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |        |        |       |       |       |       |        |       |       |
|---------------------------------------|--------|--------|-------|--------|--------|-------|-------|-------|-------|--------|-------|-------|
| X, volume / capacity                  | 0.80   | 0.31   | 0.28  | 0.57   | 0.36   | 0.06  | 0.09  | 0.27  | 0.30  | 0.88   | 0.20  | 0.08  |
| d, Delay for Lane Group [s/veh]       | 41.32  | 10.26  | 10.51 | 37.14  | 18.48  | 15.90 | 20.81 | 33.00 | 33.33 | 40.42  | 26.97 | 26.16 |
| Lane Group LOS                        | D      | B      | B     | D      | B      | B     | C     | C     | C     | D      | C     | C     |
| Critical Lane Group                   | Yes    | No     | No    | Yes    | No     | No    | No    | No    | Yes   | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.24   | 2.27   | 1.95  | 2.99   | 2.86   | 0.41  | 0.61  | 1.05  | 0.99  | 3.86   | 1.19  | 0.40  |
| 50th-Percentile Queue Length [ft/ln]  | 80.99  | 56.68  | 48.63 | 74.69  | 71.47  | 10.29 | 15.22 | 26.22 | 24.73 | 96.43  | 29.74 | 9.94  |
| 95th-Percentile Queue Length [veh/ln] | 5.83   | 4.08   | 3.50  | 5.38   | 5.15   | 0.74  | 1.10  | 1.89  | 1.78  | 6.94   | 2.14  | 0.72  |
| 95th-Percentile Queue Length [ft/ln]  | 145.78 | 102.02 | 87.53 | 134.44 | 128.64 | 18.52 | 27.40 | 47.20 | 44.51 | 173.58 | 53.54 | 17.88 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 41.32 | 10.26 | 10.51 | 37.14 | 18.48 | 15.90 | 20.81 | 33.00 | 33.33 | 40.42 | 26.97 | 26.16 |
| Movement LOS                    | D     | B     | B     | D     | B     | B     | C     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 15.42 |       |       | 22.43 |       |       | 29.61 |       |       | 37.54 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 23.03 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.462 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

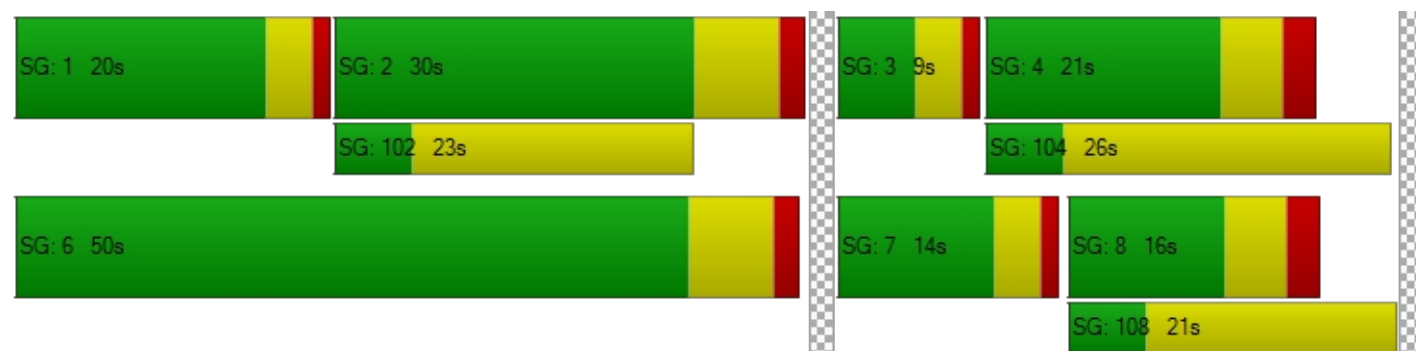
|                              |        |        |        |        |        |       |       |        |       |        |       |       |
|------------------------------|--------|--------|--------|--------|--------|-------|-------|--------|-------|--------|-------|-------|
| Vehicle Miles Traveled [mph] | 54.23  | 195.57 | 80.53  | 36.48  | 120.10 | 9.43  | 15.08 | 19.34  | 18.03 | 58.11  | 11.59 | 3.97  |
| Stops [stops/h]              | 145.78 | 204.05 | 87.53  | 134.44 | 257.29 | 18.52 | 27.40 | 47.20  | 44.51 | 347.15 | 53.54 | 17.88 |
| Fuel consumption [US gal/h]  | 5.91   | 11.57  | 4.84   | 4.83   | 10.62  | 0.78  | 0.98  | 1.49   | 1.40  | 7.96   | 1.26  | 0.42  |
| CO [g/h]                     | 413.06 | 809.04 | 338.57 | 337.50 | 742.08 | 54.69 | 68.20 | 104.05 | 97.52 | 556.37 | 88.19 | 29.64 |
| NOx [g/h]                    | 80.37  | 157.41 | 65.87  | 65.67  | 144.38 | 10.64 | 13.27 | 20.24  | 18.97 | 108.25 | 17.16 | 5.77  |
| VOC [g/h]                    | 95.73  | 187.50 | 78.47  | 78.22  | 171.98 | 12.68 | 15.81 | 24.11  | 22.60 | 128.94 | 20.44 | 6.87  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 31.51 |  |  | 31.51 |  |  | 31.51 |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.396 |  |  | 2.925 |  |  | 2.343 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | C     |  |  | C     |  |  | B     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1075  |  |  | 575   |  |  | 250   |  |  | 375   |  |  |
| d_b, Bicycle Delay [s]                                   | 8.56  |  |  | 20.31 |  |  | 30.63 |  |  | 26.41 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.561 |  |  | 2.139 |  |  | 1.903 |  |  | 2.395 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | A     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 11.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.007 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 3                | 1      | 142            | 1      | 6              | 168    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280         | 1.1280 | 1.1280         | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0              | 0      | 0              | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 3                | 1      | 160            | 1      | 7              | 190    |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500         | 0.8500 | 0.8500         | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1                | 0      | 47             | 0      | 2              | 56     |
| Total Analysis Volume [veh/h]           | 4                | 1      | 188            | 1      | 8              | 224    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01  | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 11.25 | 9.27 | 0.00 | 0.00 | 7.61 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02  | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.61  | 0.61 | 0.00 | 0.00 | 0.44 | 0.00 |
| d_A, Approach Delay [s/veh]           | 10.86 |      | 0.00 |      | 0.26 |      |
| Approach LOS                          | B     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.27  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 12.4  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.064 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Stapleton Dr                                                                        |        | Stapleton Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Southbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Left                                                                                | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 115.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 45.00                                                                               |        | 45.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|-----------------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 25               | 1      | 1            | 151    | 236          | 57     |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00         | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280       | 1.1280 | 1.1280       | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0            | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0            | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0            | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0            | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0            | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0            | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 28               | 1      | 1            | 170    | 266          | 64     |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500       | 0.8500 | 0.8500       | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 8                | 0      | 0            | 50     | 78           | 19     |
| Total Analysis Volume [veh/h]           | 33               | 1      | 1            | 200    | 313          | 75     |
| Pedestrian Volume [ped/h]               | 0                |        | 0            |        | 0            |        |

**Intersection Settings**

| Priority Scheme                    | Stop | Free | Free |
|------------------------------------|------|------|------|
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.06  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 12.40 | 9.96 | 8.08 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.20  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 5.07  | 0.10 | 0.04 | 0.04 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 12.33 |      | 0.04 |      | 0.00 |      |
| Approach LOS                          | B     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.69  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 8.5   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.007 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Southbound                                                                          |        | Waterbury Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 30.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Southbound |        | Waterbury Dr |        |
|-----------------------------------------|------------------|--------|------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 15               | 43     | 21         | 0      | 0            | 5      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00       | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280     | 1.1280 | 1.1280       | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0          | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0          | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0          | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0          | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0          | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0          | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 17               | 49     | 24         | 0      | 0            | 6      |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500     | 0.8500 | 0.8500       | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5                | 14     | 7          | 0      | 0            | 2      |
| Total Analysis Volume [veh/h]           | 20               | 58     | 28         | 0      | 0            | 7      |
| Pedestrian Volume [ped/h]               | 0                |        | 0          |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.29 | 0.00 | 0.00 | 0.00 | 9.22 | 8.46 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.03 | 0.03 | 0.00 | 0.00 | 0.02 | 0.02 |
| 95th-Percentile Queue Length [ft/ln]  | 0.84 | 0.84 | 0.00 | 0.00 | 0.50 | 0.50 |
| d_A, Approach Delay [s/veh]           | 1.87 |      | 0.00 |      | 8.46 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.81 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.0   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.002 |

#### Intersection Setup

| Name                         |                                                                                   |        | Liberty Grove Dr                                                                    |        | Salem Ct                                                                            |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 25.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    |        |        | Liberty Grove Dr |        | Salem Ct |        |
|-----------------------------------------|--------|--------|------------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 9      | 36     | 17               | 2      | 2        | 3      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00             | 2.00   | 2.00     | 2.00   |
| Growth Factor                           | 1.1280 | 1.1280 | 1.1280           | 1.1280 | 1.1280   | 1.1280 |
| In-Process Volume [veh/h]               | 0      | 0      | 0                | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0                | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0                | 0      | 0        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0                | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0                | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0                | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 10     | 41     | 19               | 2      | 2        | 3      |
| Peak Hour Factor                        | 0.8500 | 0.8500 | 0.8500           | 0.8500 | 0.8500   | 0.8500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3      | 12     | 6                | 1      | 1        | 1      |
| Total Analysis Volume [veh/h]           | 12     | 48     | 22               | 2      | 2        | 4      |
| Pedestrian Volume [ped/h]               | 0      |        | 0                |        | 0        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 7.28 | 0.00 | 0.00 | 0.00 | 9.03 | 8.44 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.00 | 0.00 | 0.02 | 0.02 |
| 95th-Percentile Queue Length [ft/ln]  | 0.50 | 0.50 | 0.00 | 0.00 | 0.45 | 0.45 |
| d_A, Approach Delay [s/veh]           | 1.46 |      | 0.00 |      | 8.64 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.55 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 197           | 161 | 4             |
| 2    | 191           | 156 | 4             |
| 3    | 187           | 153 | 4             |
| 4    | 175           | 143 | 4             |
| 5    | 156           | 127 | 3             |
| 6    | 154           | 126 | 3             |
| 7    | 152           | 124 | 3             |
| 8    | 138           | 113 | 3             |
| 9    | 136           | 111 | 3             |
| 10   | 134           | 109 | 3             |
| 11   | 116           | 95  | 2             |
| 12   | 108           | 89  | 2             |
| 13   | 106           | 87  | 2             |
| 14   | 79            | 64  | 2             |
| 15   | 79            | 64  | 2             |
| 16   | 55            | 45  | 1             |
| 17   | 32            | 26  | 1             |
| 18   | 32            | 26  | 1             |
| 19   | 18            | 14  | 0             |
| 20   | 10            | 8   | 0             |
| 21   | 6             | 5   | 0             |
| 22   | 2             | 2   | 0             |
| 23   | 2             | 2   | 0             |
| 24   | 2             | 2   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 358    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 347    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 340    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 318    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 283    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 280    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 276    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 251    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 247    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 243    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 211    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 197    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 193    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 143    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 143    | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 100    | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 58     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 58     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 32     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 18     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 11     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 10.9      |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 4         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 362       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | N    |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | N             |
| 1    | 330           | 171 | 29            |
| 2    | 320           | 166 | 28            |
| 3    | 314           | 162 | 28            |
| 4    | 294           | 152 | 26            |
| 5    | 261           | 135 | 23            |
| 6    | 257           | 133 | 23            |
| 7    | 254           | 132 | 22            |
| 8    | 231           | 120 | 20            |
| 9    | 228           | 118 | 20            |
| 10   | 224           | 116 | 20            |
| 11   | 195           | 101 | 17            |
| 12   | 182           | 94  | 16            |
| 13   | 178           | 92  | 16            |
| 14   | 132           | 68  | 12            |
| 15   | 132           | 68  | 12            |
| 16   | 92            | 48  | 8             |
| 17   | 53            | 27  | 5             |
| 18   | 53            | 27  | 5             |
| 19   | 30            | 15  | 3             |
| 20   | 17            | 9   | 1             |
| 21   | 10            | 5   | 1             |
| 22   | 3             | 2   | 0             |
| 23   | 3             | 2   | 0             |
| 24   | 3             | 2   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 501    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 486    | 2            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 476    | 2            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 446    | 2            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 396    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 390    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 386    | 2            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 351    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 346    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 340    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 296    | 2            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 276    | 2            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 270    | 2            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 200    | 2            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 200    | 2            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 140    | 2            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 80     | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 80     | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 45     | 2            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 26     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 15     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 5      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 5      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 5      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | N         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 12.3      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:05      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 29        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 530       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 66            | 24 | 6             |
| 2    | 64            | 23 | 6             |
| 3    | 63            | 23 | 6             |
| 4    | 59            | 21 | 5             |
| 5    | 52            | 19 | 5             |
| 6    | 51            | 19 | 5             |
| 7    | 51            | 18 | 5             |
| 8    | 46            | 17 | 4             |
| 9    | 46            | 17 | 4             |
| 10   | 45            | 16 | 4             |
| 11   | 39            | 14 | 4             |
| 12   | 36            | 13 | 3             |
| 13   | 36            | 13 | 3             |
| 14   | 26            | 10 | 2             |
| 15   | 26            | 10 | 2             |
| 16   | 18            | 7  | 2             |
| 17   | 11            | 4  | 1             |
| 18   | 11            | 4  | 1             |
| 19   | 6             | 2  | 1             |
| 20   | 3             | 1  | 0             |
| 21   | 2             | 1  | 0             |
| 22   | 1             | 0  | 0             |
| 23   | 1             | 0  | 0             |
| 24   | 1             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 90     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 87     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 86     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 80     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 71     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 70     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 69     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 63     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 63     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 61     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 53     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 49     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 49     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 36     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 36     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 25     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 15     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 15     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 8      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.5       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 6         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 96        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 51            | 21 | 5             |
| 2    | 49            | 20 | 5             |
| 3    | 48            | 20 | 5             |
| 4    | 45            | 19 | 4             |
| 5    | 40            | 17 | 4             |
| 6    | 40            | 16 | 4             |
| 7    | 39            | 16 | 4             |
| 8    | 36            | 15 | 4             |
| 9    | 35            | 14 | 3             |
| 10   | 35            | 14 | 3             |
| 11   | 30            | 12 | 3             |
| 12   | 28            | 12 | 3             |
| 13   | 28            | 11 | 3             |
| 14   | 20            | 8  | 2             |
| 15   | 20            | 8  | 2             |
| 16   | 14            | 6  | 1             |
| 17   | 8             | 3  | 1             |
| 18   | 8             | 3  | 1             |
| 19   | 5             | 2  | 0             |
| 20   | 3             | 1  | 0             |
| 21   | 2             | 1  | 0             |
| 22   | 1             | 0  | 0             |
| 23   | 1             | 0  | 0             |
| 24   | 1             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 72     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 69     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 68     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 64     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 57     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 56     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 55     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 51     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 49     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 49     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 42     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 40     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 39     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 28     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 28     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 20     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 11     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 11     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 7      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 8.6       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 5         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 77        |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

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### Intersection Level Of Service Report

#### Intersection 1: Meridian Road/Stapleton Drive

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 24.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.756 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 157         | 346    | 141    | 110         | 980    | 9      | 15           | 75     | 252    | 350          | 145    | 155    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 11          | 0      | 0      | 0           | 0      | 7      | 20           | 9      | 34     | 0            | 3      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 80     | 0           | 0      | 9      | 0            | 0      | 159    | 0            | 0      | 88     |
| Total Hourly Volume [veh/h]                 | 188         | 390    | 79     | 124         | 1105   | 8      | 37           | 94     | 159    | 395          | 167    | 87     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 55          | 115    | 23     | 36          | 325    | 2      | 11           | 28     | 47     | 116          | 49     | 26     |
| Total Analysis Volume [veh/h]               | 221         | 459    | 93     | 146         | 1300   | 9      | 44           | 111    | 187    | 465          | 196    | 102    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 80                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal Group                    | 1       | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7       | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]               | 20      | 70      | 0       | 20      | 70      | 0       | 5       | 40      | 0       | 5       | 40      | 0       |
| Amber [s]                       | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0     | 4.0     | 0.0     |
| All red [s]                     | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 1.0     | 3.0     | 0.0     | 1.0     | 3.0     | 0.0     |
| Walk [s]                        | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       |
| Pedestrian Clearance [s]        | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0       | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0     | 5.5     | 0.0     | 5.0     | 5.5     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0     | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 87   | 54  | 0   | 87   | 54  | 0   | 84   | 17  | 0   | 9    | 26  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        |      | No  |     |      | No  |     |      | No  |     | No   | No  |     |
| Maximum Recall        |      | No  |     |      | No  |     |      | No  |     | No   | No  |     |
| Pedestrian Recall     |      | No  |     |      | No  |     |      | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | R    | L     | C     | R    | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 80    | 80   | 80   | 80    | 80    | 80   | 80    | 80    | 80    | 80    | 80    | 80    |
| L, Total Lost Time per Cycle [s]        | 7.50  | 7.50 | 7.50 | 7.50  | 7.50  | 7.50 | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00 | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.50  | 5.50 | 5.50 | 5.50  | 5.50  | 5.50 | 5.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 47    | 47   | 47   | 47    | 47    | 47   | 10    | 10    | 10    | 19    | 19    | 19    |
| g / C, Green / Cycle                    | 0.58  | 0.58 | 0.58 | 0.58  | 0.58  | 0.58 | 0.13  | 0.13  | 0.13  | 0.24  | 0.24  | 0.24  |
| (v / s)_i Volume / Saturation Flow Rate | 0.53  | 0.13 | 0.06 | 0.17  | 0.37  | 0.01 | 0.04  | 0.06  | 0.12  | 0.18  | 0.10  | 0.06  |
| s, saturation flow rate [veh/h]         | 420   | 3560 | 1589 | 856   | 3560  | 1589 | 1081  | 1870  | 1589  | 2600  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 223   | 2070 | 924  | 513   | 2070  | 924  | 102   | 234   | 199   | 678   | 444   | 378   |
| d1, Uniform Delay [s]                   | 32.33 | 8.05 | 7.45 | 12.31 | 11.05 | 7.05 | 39.89 | 32.56 | 34.71 | 28.36 | 25.98 | 24.85 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 57.47 | 0.25 | 0.22 | 1.39  | 1.46  | 0.02 | 2.89  | 1.50  | 18.46 | 1.24  | 0.69  | 0.38  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |       |       |        |      |       |       |        |        |        |       |
|---------------------------------------|--------|-------|-------|-------|--------|------|-------|-------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.99   | 0.22  | 0.10  | 0.28  | 0.63   | 0.01 | 0.43  | 0.47  | 0.94   | 0.69   | 0.44   | 0.27  |
| d, Delay for Lane Group [s/veh]       | 89.79  | 8.30  | 7.67  | 13.70 | 12.50  | 7.07 | 42.78 | 34.05 | 53.16  | 29.60  | 26.67  | 25.23 |
| Lane Group LOS                        | F      | A     | A     | B     | B      | A    | D     | C     | D      | C      | C      | C     |
| Critical Lane Group                   | Yes    | No    | No    | No    | No     | No   | No    | No    | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 7.59   | 1.46  | 0.58  | 1.47  | 5.83   | 0.05 | 0.93  | 1.97  | 4.38   | 3.71   | 3.01   | 1.50  |
| 50th-Percentile Queue Length [ft/ln]  | 189.73 | 36.59 | 14.45 | 36.67 | 145.73 | 1.32 | 23.16 | 49.27 | 109.60 | 92.77  | 75.36  | 37.46 |
| 95th-Percentile Queue Length [veh/ln] | 12.11  | 2.63  | 1.04  | 2.64  | 9.79   | 0.09 | 1.67  | 3.55  | 7.82   | 6.68   | 5.43   | 2.70  |
| 95th-Percentile Queue Length [ft/ln]  | 302.68 | 65.86 | 26.01 | 66.00 | 244.73 | 2.37 | 41.69 | 88.69 | 195.44 | 166.98 | 135.65 | 67.42 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |       |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 89.79 | 8.30 | 7.67 | 13.70 | 12.50 | 7.07 | 42.78 | 34.05 | 53.16 | 29.60 | 26.67 | 25.23 |
| Movement LOS                    | F     | A    | A    | B     | B     | A    | D     | C     | D     | C     | C     | C     |
| d_A, Approach Delay [s/veh]     | 31.52 |      |      | 12.59 |       |      | 45.62 |       |       | 28.26 |       |       |
| Approach LOS                    | C     |      |      | B     |       |      | D     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 23.96 |      |      |       |       |      |       |       |       |       |       |       |
| Intersection LOS                | C     |      |      |       |       |      |       |       |       |       |       |       |
| Intersection V/C                | 0.756 |      |      |       |       |      |       |       |       |       |       |       |

**Emissions**

|                              |        |        |        |        |         |      |       |        |        |        |        |        |
|------------------------------|--------|--------|--------|--------|---------|------|-------|--------|--------|--------|--------|--------|
| Vehicle Miles Traveled [mph] | 90.35  | 187.65 | 38.02  | 14.25  | 126.91  | 0.88 | 4.33  | 10.92  | 18.40  | 97.10  | 40.93  | 21.30  |
| Stops [stops/h]              | 341.52 | 131.72 | 26.01  | 66.00  | 524.64  | 2.37 | 41.69 | 88.69  | 197.28 | 333.97 | 135.65 | 67.42  |
| Fuel consumption [US gal/h]  | 13.40  | 9.50   | 1.90   | 2.11   | 17.30   | 0.09 | 1.05  | 2.25   | 5.11   | 10.28  | 4.15   | 2.09   |
| CO [g/h]                     | 936.93 | 663.99 | 132.82 | 147.48 | 1209.17 | 6.04 | 73.38 | 157.01 | 356.94 | 718.69 | 290.31 | 146.24 |
| NOx [g/h]                    | 182.29 | 129.19 | 25.84  | 28.69  | 235.26  | 1.18 | 14.28 | 30.55  | 69.45  | 139.83 | 56.48  | 28.45  |
| VOC [g/h]                    | 217.14 | 153.89 | 30.78  | 34.18  | 280.24  | 1.40 | 17.01 | 36.39  | 82.72  | 166.56 | 67.28  | 33.89  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | F     |  |  | F     |  |  | F     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1163  |  |  | 1163  |  |  | 250   |  |  | 475   |  |  |
| d_b, Bicycle Delay [s]                                   | 7.01  |  |  | 7.01  |  |  | 30.63 |  |  | 23.26 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.263 |  |  | 2.767 |  |  | 2.386 |  |  | 2.964 |  |  |
| Bicycle LOS                                              | B     |  |  | C     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 26.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.491 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 98          | 328    | 109    | 70          | 411    | 57     | 102            | 131    | 263    | 397            | 176    | 169    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 15     | 5      | 0           | 5      | 5      | 15             | 5      | 0      | 2              | 2      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 64     | 0           | 0      | 35     | 0              | 0      | 149    | 0              | 0      | 96     |
| Total Hourly Volume [veh/h]                 | 111         | 385    | 64     | 79          | 469    | 34     | 130            | 153    | 148    | 450            | 201    | 95     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 33          | 113    | 19     | 23          | 138    | 10     | 38             | 45     | 44     | 132            | 59     | 28     |
| Total Analysis Volume [veh/h]               | 131         | 453    | 75     | 93          | 552    | 40     | 153            | 180    | 174    | 529            | 236    | 112    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 80                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 0       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 0       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |     |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 15   | 45  | 0   | 0   | 30  | 0   | 9    | 16  | 0   | 19   | 26  | 0   |
| Lead / Lag            | Lead | -   | -   | -   | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 0   | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00  | 5.00  | 5.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 7     | 38    | 38    | 27    | 27    | 27    | 29    | 11    | 11    | 14    | 20    | 20    |
| g / C, Green / Cycle                    | 0.09  | 0.48  | 0.48  | 0.34  | 0.34  | 0.34  | 0.36  | 0.13  | 0.13  | 0.18  | 0.25  | 0.25  |
| (v / s)_i Volume / Saturation Flow Rate | 0.07  | 0.13  | 0.05  | 0.11  | 0.16  | 0.03  | 0.13  | 0.10  | 0.11  | 0.15  | 0.13  | 0.07  |
| s, saturation flow rate [veh/h]         | 1781  | 3560  | 1589  | 875   | 3560  | 1589  | 1215  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 169   | 1706  | 762   | 290   | 1191  | 532   | 457   | 246   | 209   | 612   | 460   | 391   |
| d1, Uniform Delay [s]                   | 35.39 | 12.43 | 11.39 | 26.63 | 20.96 | 18.17 | 18.58 | 33.40 | 33.89 | 31.99 | 26.04 | 24.48 |
| k, delay calibration                    | 0.11  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 7.49  | 0.38  | 0.26  | 2.90  | 1.30  | 0.28  | 1.97  | 4.20  | 8.38  | 3.81  | 0.89  | 0.40  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |       |       |       |        |       |       |        |        |        |        |       |
|---------------------------------------|--------|-------|-------|-------|--------|-------|-------|--------|--------|--------|--------|-------|
| X, volume / capacity                  | 0.78   | 0.27  | 0.10  | 0.32  | 0.46   | 0.08  | 0.33  | 0.73   | 0.83   | 0.86   | 0.51   | 0.29  |
| d, Delay for Lane Group [s/veh]       | 42.88  | 12.81 | 11.65 | 29.53 | 22.26  | 18.45 | 20.55 | 37.59  | 42.27  | 35.80  | 26.93  | 24.88 |
| Lane Group LOS                        | D      | B     | B     | C     | C      | B     | C     | D      | D      | D      | C      | C     |
| Critical Lane Group                   | Yes    | No    | No    | No    | Yes    | No    | No    | No     | Yes    | Yes    | No     | No    |
| 50th-Percentile Queue Length [veh/ln] | 2.63   | 2.05  | 0.65  | 1.60  | 3.73   | 0.48  | 2.11  | 3.51   | 3.65   | 5.07   | 3.80   | 1.69  |
| 50th-Percentile Queue Length [ft/ln]  | 65.76  | 51.31 | 16.24 | 39.93 | 93.15  | 12.04 | 52.87 | 87.72  | 91.19  | 126.63 | 94.95  | 42.18 |
| 95th-Percentile Queue Length [veh/ln] | 4.73   | 3.69  | 1.17  | 2.88  | 6.71   | 0.87  | 3.81  | 6.32   | 6.57   | 8.76   | 6.84   | 3.04  |
| 95th-Percentile Queue Length [ft/ln]  | 118.37 | 92.35 | 29.23 | 71.88 | 167.67 | 21.68 | 95.16 | 157.90 | 164.14 | 218.91 | 170.91 | 75.92 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 42.88 | 12.81 | 11.65 | 29.53 | 22.26 | 18.45 | 20.55 | 37.59 | 42.27 | 35.80 | 26.93 | 24.88 |
| Movement LOS                    | D     | B     | B     | C     | C     | B     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 18.66 |       |       | 23.03 |       |       | 34.05 |       |       | 32.02 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | C     |       |       | C     |       |       |
| d_I, Intersection Delay [s/veh] | 26.91 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.491 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

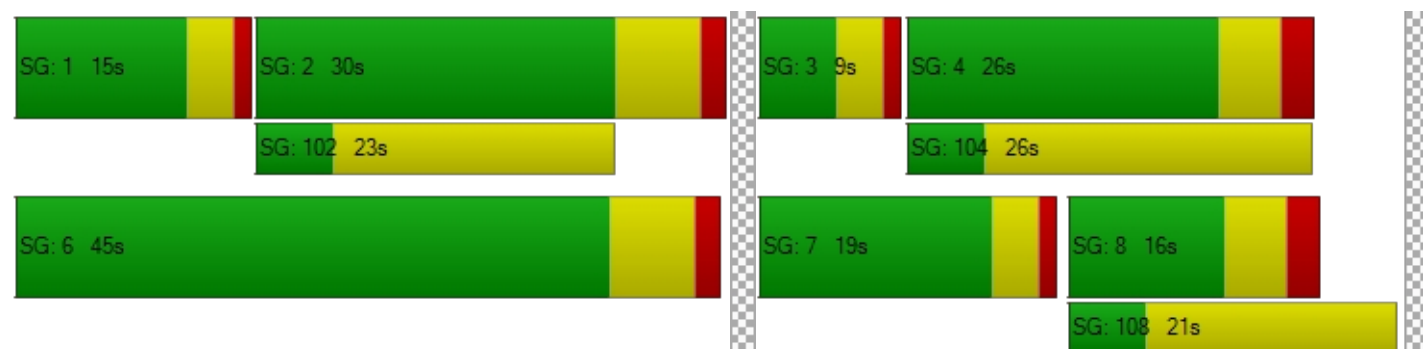
|                              |        |        |        |        |        |       |        |        |        |        |        |        |
|------------------------------|--------|--------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|
| Vehicle Miles Traveled [mph] | 43.06  | 148.90 | 24.65  | 23.08  | 136.97 | 9.93  | 50.17  | 59.02  | 57.05  | 80.68  | 35.99  | 17.08  |
| Stops [stops/h]              | 118.37 | 184.70 | 29.23  | 71.88  | 335.34 | 21.68 | 95.16  | 157.90 | 164.14 | 455.88 | 170.91 | 75.92  |
| Fuel consumption [US gal/h]  | 4.78   | 9.59   | 1.55   | 2.67   | 13.31  | 0.88  | 3.27   | 4.81   | 4.91   | 10.36  | 3.95   | 1.79   |
| CO [g/h]                     | 334.27 | 670.53 | 108.02 | 186.35 | 930.47 | 61.85 | 228.40 | 336.50 | 342.91 | 724.00 | 276.14 | 125.05 |
| NOx [g/h]                    | 65.04  | 130.46 | 21.02  | 36.26  | 181.04 | 12.03 | 44.44  | 65.47  | 66.72  | 140.86 | 53.73  | 24.33  |
| VOC [g/h]                    | 77.47  | 155.40 | 25.04  | 43.19  | 215.65 | 14.33 | 52.93  | 77.99  | 79.47  | 167.79 | 64.00  | 28.98  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 31.51 |  |  | 31.51 |  |  | 31.51 |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.173 |  |  | 3.014 |  |  | 2.651 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | C     |  |  | C     |  |  | B     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 950   |  |  | 575   |  |  | 250   |  |  | 500   |  |  |
| d_b, Bicycle Delay [s]                                   | 11.03 |  |  | 20.31 |  |  | 30.63 |  |  | 22.50 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.156 |  |  | 2.154 |  |  | 2.642 |  |  | 3.165 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 21.6  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.051 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 7                | 6      | 489            | 15     | 4              | 300    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280         | 1.1280 | 1.1280         | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 2                | 20     | 0              | 1      | 7              | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 10               | 27     | 552            | 18     | 12             | 338    |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500         | 0.8500 | 0.8500         | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3                | 8      | 162            | 5      | 4              | 99     |
| Total Analysis Volume [veh/h]           | 12               | 32     | 649            | 21     | 14             | 398    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.05  | 0.07  | 0.01 | 0.00 | 0.02 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 21.59 | 14.10 | 0.00 | 0.00 | 8.97 | 0.00 |
| Movement LOS                          | C     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.40  | 0.40  | 0.00 | 0.00 | 0.05 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 10.12 | 10.12 | 0.00 | 0.00 | 1.16 | 0.00 |
| d_A, Approach Delay [s/veh]           | 16.14 |       | 0.00 |      | 0.30 |      |
| Approach LOS                          | C     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.74  |       |      |      |      |      |
| Intersection LOS                      | C     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 19.8  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.331 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Stapleton Dr                                                                        |        | Stapleton Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Southbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Left                                                                                | Thru   | Thru                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 115.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 45.00                                                                               |        | 45.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|-----------------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 35               | 17     | 0            | 293    | 294          | 13     |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00         | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280       | 1.1280 | 1.1280       | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0            | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 63               | 2      | 1            | 0      | 0            | 21     |
| Diverted Trips [veh/h]                  | 0                | 0      | 0            | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0            | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0            | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0            | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 102              | 21     | 1            | 331    | 332          | 36     |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500       | 0.8500 | 0.8500       | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 30               | 6      | 0            | 97     | 98           | 11     |
| Total Analysis Volume [veh/h]           | 120              | 25     | 1            | 389    | 391          | 42     |
| Pedestrian Volume [ped/h]               | 0                |        | 0            |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.33  | 0.04  | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 19.77 | 10.69 | 8.20 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          | C     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 1.42  | 0.12  | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 35.46 | 2.96  | 0.04 | 0.04 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 18.20 |       | 0.02 |      | 0.00 |      |
| Approach LOS                          | C     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 2.74  |       |      |      |      |      |
| Intersection LOS                      | C     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.8   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.048 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        |        |                                                                                   |        |        | Waterbury Dr                                                                        |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        |        |        |        |        | Waterbury Dr |        |        |        |        |        |
|-----------------------------------------|------------------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 7                | 13     | 0      | 0      | 41     | 0      | 0            | 0      | 7      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                | 11     | 11     | 4      | 32     | 0      | 0            | 0      | 0      | 32     | 0      | 11     |
| Diverted Trips [veh/h]                  | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 8                | 26     | 11     | 4      | 78     | 0      | 0            | 0      | 8      | 32     | 0      | 11     |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2                | 8      | 3      | 1      | 23     | 0      | 0            | 0      | 2      | 9      | 0      | 3      |
| Total Analysis Volume [veh/h]           | 9                | 31     | 13     | 5      | 92     | 0      | 0            | 0      | 9      | 38     | 0      | 13     |
| Pedestrian Volume [ped/h]               | 0                |        |        | 0      |        |        | 0            |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |      |       |      |      |       |      |
|---------------------------------------|------|------|------|------|------|------|------|-------|------|------|-------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.01 | 0.05 | 0.00  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.41 | 0.00 | 0.00 | 7.31 | 0.00 | 0.00 | 9.63 | 10.02 | 8.76 | 9.85 | 10.23 | 8.76 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | A    | B     | A    | A    | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.03 | 0.03  | 0.03 | 0.19 | 0.19  | 0.19 |
| 95th-Percentile Queue Length [ft/ln]  | 0.40 | 0.40 | 0.40 | 0.21 | 0.21 | 0.21 | 0.71 | 0.71  | 0.71 | 4.84 | 4.84  | 4.84 |
| d_A, Approach Delay [s/veh]           | 1.26 |      |      | 0.38 |      |      | 8.76 |       |      | 9.57 |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | A    |       |      | A    |       |      |
| d_I, Intersection Delay [s/veh]       | 3.19 |      |      |      |      |      |      |       |      |      |       |      |
| Intersection LOS                      | A    |      |      |      |      |      |      |       |      |      |       |      |

**Intersection Level Of Service Report**  
**Intersection 6: Liberty Grove Dr/Salem Ct**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.4   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.044 |

**Intersection Setup**

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Salem Ct                                                                            |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 25.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Salem Ct |        |        |        |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 3      | 10     | 0      | 0                | 34     | 1      | 1        | 0      | 6      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00             | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.1280 | 1.1280 | 1.1280 | 1.1280           | 1.1280 | 1.1280 | 1.1280   | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 11     | 11     | 4                | 4      | 0      | 0        | 0      | 0      | 32     | 0      | 11     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 3      | 22     | 11     | 4                | 42     | 1      | 1        | 0      | 7      | 32     | 0      | 11     |
| Peak Hour Factor                        | 0.8500 | 0.8500 | 0.8500 | 0.8500           | 0.8500 | 0.8500 | 0.8500   | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1      | 6      | 3      | 1                | 12     | 0      | 0        | 0      | 2      | 9      | 0      | 3      |
| Total Analysis Volume [veh/h]           | 4      | 26     | 13     | 5                | 49     | 1      | 1        | 0      | 8      | 38     | 0      | 13     |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0        |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.04 | 0.00 | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.32 | 0.00 | 0.00 | 7.30 | 0.00 | 0.00 | 9.23 | 9.65 | 8.57 | 9.40 | 9.83 | 8.70 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.03 | 0.03 | 0.18 | 0.18 | 0.18 |
| 95th-Percentile Queue Length [ft/ln]  | 0.18 | 0.18 | 0.18 | 0.21 | 0.21 | 0.21 | 0.68 | 0.68 | 0.68 | 4.48 | 4.48 | 4.48 |
| d_A, Approach Delay [s/veh]           | 0.68 |      |      | 0.66 |      |      | 8.64 |      |      | 9.22 |      |      |
| Approach LOS                          | A    |      |      | A    |      |      | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 3.89 |      |      |      |      |      |      |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |      |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 350           | 570 | 37            |
| 2    | 340           | 553 | 36            |
| 3    | 333           | 542 | 35            |
| 4    | 312           | 507 | 33            |
| 5    | 277           | 450 | 29            |
| 6    | 273           | 445 | 29            |
| 7    | 270           | 439 | 28            |
| 8    | 245           | 399 | 26            |
| 9    | 241           | 393 | 26            |
| 10   | 238           | 388 | 25            |
| 11   | 207           | 336 | 22            |
| 12   | 193           | 314 | 20            |
| 13   | 189           | 308 | 20            |
| 14   | 140           | 228 | 15            |
| 15   | 140           | 228 | 15            |
| 16   | 98            | 160 | 10            |
| 17   | 56            | 91  | 6             |
| 18   | 56            | 91  | 6             |
| 19   | 32            | 51  | 3             |
| 20   | 18            | 29  | 2             |
| 21   | 11            | 17  | 1             |
| 22   | 4             | 6   | 0             |
| 23   | 4             | 6   | 0             |
| 24   | 4             | 6   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 920    | 1            | 37     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 893    | 1            | 36     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 875    | 1            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 819    | 1            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 727    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 718    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 709    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 644    | 1            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 634    | 1            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 626    | 1            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 543    | 1            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 507    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 497    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 368    | 1            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 368    | 1            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 258    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 147    | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 147    | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 83     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 47     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 28     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 10     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 10     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 10     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 16.1      |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:09      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 37        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 957       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | N    |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | N             |
| 1    | 368           | 332 | 123           |
| 2    | 357           | 322 | 119           |
| 3    | 350           | 315 | 117           |
| 4    | 328           | 295 | 109           |
| 5    | 291           | 262 | 97            |
| 6    | 287           | 259 | 96            |
| 7    | 283           | 256 | 95            |
| 8    | 258           | 232 | 86            |
| 9    | 254           | 229 | 85            |
| 10   | 250           | 226 | 84            |
| 11   | 217           | 196 | 73            |
| 12   | 202           | 183 | 68            |
| 13   | 199           | 179 | 66            |
| 14   | 147           | 133 | 49            |
| 15   | 147           | 133 | 49            |
| 16   | 103           | 93  | 34            |
| 17   | 59            | 53  | 20            |
| 18   | 59            | 53  | 20            |
| 19   | 33            | 30  | 11            |
| 20   | 18            | 17  | 6             |
| 21   | 11            | 10  | 4             |
| 22   | 4             | 3   | 1             |
| 23   | 4             | 3   | 1             |
| 24   | 4             | 3   | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 700    | 2            | 123    | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 2         | 2             | 679    | 2            | 119    | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 3         | 2             | 665    | 2            | 117    | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 4         | 2             | 623    | 2            | 109    | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 5         | 2             | 553    | 2            | 97     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 6         | 2             | 546    | 2            | 96     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 7         | 2             | 539    | 2            | 95     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 8         | 2             | 490    | 2            | 86     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 483    | 2            | 85     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 476    | 2            | 84     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 413    | 2            | 73     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 385    | 2            | 68     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 378    | 2            | 66     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 280    | 2            | 49     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 280    | 2            | 49     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 196    | 2            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 112    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 112    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 63     | 2            | 11     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 35     | 2            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 21     | 2            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 7      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 7      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 7      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 3   | 0                     | 0   | 3   | 7   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | N         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 18.2      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:37      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 123       |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 823       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 45            | 82 | 43            | 8 |
| 2    | 44            | 80 | 42            | 8 |
| 3    | 43            | 78 | 41            | 8 |
| 4    | 40            | 73 | 38            | 7 |
| 5    | 36            | 65 | 34            | 6 |
| 6    | 35            | 64 | 34            | 6 |
| 7    | 35            | 63 | 33            | 6 |
| 8    | 31            | 57 | 30            | 6 |
| 9    | 31            | 57 | 30            | 6 |
| 10   | 31            | 56 | 29            | 5 |
| 11   | 27            | 48 | 25            | 5 |
| 12   | 25            | 45 | 24            | 4 |
| 13   | 24            | 44 | 23            | 4 |
| 14   | 18            | 33 | 17            | 3 |
| 15   | 18            | 33 | 17            | 3 |
| 16   | 13            | 23 | 12            | 2 |
| 17   | 7             | 13 | 7             | 1 |
| 18   | 7             | 13 | 7             | 1 |
| 19   | 4             | 7  | 4             | 1 |
| 20   | 2             | 4  | 2             | 0 |
| 21   | 1             | 2  | 1             | 0 |
| 22   | 0             | 1  | 0             | 0 |
| 23   | 0             | 1  | 0             | 0 |
| 24   | 0             | 1  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 127    | 1            | 43     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 124    | 1            | 42     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 121    | 1            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 113    | 1            | 38     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 101    | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 99     | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 98     | 1            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 88     | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 88     | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 87     | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 75     | 1            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 70     | 1            | 24     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 68     | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 51     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 51     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 36     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 20     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 20     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 11     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 6      | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 3      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.6       | 8.8  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:06      | 0:01 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 43        | 8    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 178       | 178  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 36            | 47 | 43            | 8 |
| 2    | 35            | 46 | 42            | 8 |
| 3    | 34            | 45 | 41            | 8 |
| 4    | 32            | 42 | 38            | 7 |
| 5    | 28            | 37 | 34            | 6 |
| 6    | 28            | 37 | 34            | 6 |
| 7    | 28            | 36 | 33            | 6 |
| 8    | 25            | 33 | 30            | 6 |
| 9    | 25            | 32 | 30            | 6 |
| 10   | 24            | 32 | 29            | 5 |
| 11   | 21            | 28 | 25            | 5 |
| 12   | 20            | 26 | 24            | 4 |
| 13   | 19            | 25 | 23            | 4 |
| 14   | 14            | 19 | 17            | 3 |
| 15   | 14            | 19 | 17            | 3 |
| 16   | 10            | 13 | 12            | 2 |
| 17   | 6             | 8  | 7             | 1 |
| 18   | 6             | 8  | 7             | 1 |
| 19   | 3             | 4  | 4             | 1 |
| 20   | 2             | 2  | 2             | 0 |
| 21   | 1             | 1  | 1             | 0 |
| 22   | 0             | 0  | 0             | 0 |
| 23   | 0             | 0  | 0             | 0 |
| 24   | 0             | 0  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 83     | 1            | 43     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 81     | 1            | 42     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 79     | 1            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 74     | 1            | 38     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 65     | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 65     | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 64     | 1            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 58     | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 57     | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 56     | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 49     | 1            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 46     | 1            | 24     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 44     | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 33     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 33     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 23     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 14     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 14     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 7      | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 4      | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 2      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 0      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.2       | 8.6  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:06      | 0:01 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 43        | 8    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 134       | 134  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 17.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.660 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 231         | 954    | 386    | 87          | 570    | 9      | 10           | 35     | 131    | 280          | 42     | 70     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 39          | 0      | 0      | 0           | 0      | 22     | 13           | 6      | 23     | 0            | 10     | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 218    | 0           | 0      | 16     | 0            | 0      | 86     | 0            | 0      | 40     |
| Total Hourly Volume [veh/h]                 | 300         | 1076   | 217    | 98          | 643    | 16     | 24           | 45     | 85     | 316          | 57     | 39     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 88          | 316    | 64     | 29          | 189    | 5      | 7            | 13     | 25     | 93           | 17     | 11     |
| Total Analysis Volume [veh/h]               | 353         | 1266   | 255    | 115         | 756    | 19     | 28           | 53     | 100    | 372          | 67     | 46     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 100                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Signal Group                    | 1       | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7       | 4       | 0       |
| Auxiliary Signal Groups         |         |         |         |         |         |         |         |         |         |         |         |         |
| Maximum Green [s]               | 20      | 70      | 0       | 20      | 70      | 0       | 5       | 40      | 0       | 5       | 40      | 0       |
| Amber [s]                       | 4.0     | 5.5     | 0.0     | 4.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0     | 4.0     | 0.0     |
| All red [s]                     | 3.0     | 2.0     | 0.0     | 3.0     | 2.0     | 0.0     | 1.0     | 3.0     | 0.0     | 1.0     | 3.0     | 0.0     |
| Walk [s]                        | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       | 0       | 7       | 0       |
| Pedestrian Clearance [s]        | 0       | 29      | 0       | 0       | 29      | 0       | 0       | 15      | 0       | 0       | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Rest In Walk                    |         | No      |         |         | No      |         |         | No      |         |         | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0     | 5.5     | 0.0     | 5.0     | 5.5     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0     | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 107  | 71  | 0   | 107  | 71  | 0   | 104  | 20  | 0   | 9    | 29  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        |      | No  |     |      | No  |     |      | No  |     | No   | No  |     |
| Maximum Recall        |      | No  |     |      | No  |     |      | No  |     | No   | No  |     |
| Pedestrian Recall     |      | No  |     |      | No  |     |      | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | R    | L     | C    | R    | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 100   | 100  | 100  | 100   | 100  | 100  | 100   | 100   | 100   | 100   | 100   | 100   |
| L, Total Lost Time per Cycle [s]        | 7.50  | 7.50 | 7.50 | 7.50  | 7.50 | 7.50 | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 2.00  | 0.00 | 0.00 | 2.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.50  | 5.50 | 5.50 | 5.50  | 5.50 | 5.50 | 5.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  |
| g_i, Effective Green Time [s]           | 66    | 66   | 66   | 66    | 66   | 66   | 10    | 10    | 10    | 19    | 19    | 19    |
| g / C, Green / Cycle                    | 0.66  | 0.66 | 0.66 | 0.66  | 0.66 | 0.66 | 0.10  | 0.10  | 0.10  | 0.19  | 0.19  | 0.19  |
| (v / s)_i Volume / Saturation Flow Rate | 0.51  | 0.36 | 0.16 | 0.34  | 0.21 | 0.01 | 0.02  | 0.03  | 0.06  | 0.13  | 0.04  | 0.03  |
| s, saturation flow rate [veh/h]         | 696   | 3560 | 1589 | 343   | 3560 | 1589 | 1279  | 1870  | 1589  | 2785  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 453   | 2363 | 1055 | 226   | 2363 | 1055 | 143   | 189   | 161   | 621   | 358   | 304   |
| d1, Uniform Delay [s]                   | 20.80 | 8.77 | 6.73 | 22.71 | 7.18 | 5.72 | 45.62 | 41.56 | 43.10 | 37.44 | 33.92 | 33.68 |
| k, delay calibration                    | 0.50  | 0.50 | 0.50 | 0.50  | 0.50 | 0.50 | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 12.49 | 0.88 | 0.54 | 7.92  | 0.36 | 0.03 | 0.66  | 0.80  | 3.88  | 0.93  | 0.25  | 0.23  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |        |        |      |       |       |        |        |       |       |
|---------------------------------------|--------|--------|-------|--------|--------|------|-------|-------|--------|--------|-------|-------|
| X, volume / capacity                  | 0.78   | 0.54   | 0.24  | 0.51   | 0.32   | 0.02 | 0.20  | 0.28  | 0.62   | 0.60   | 0.19  | 0.15  |
| d, Delay for Lane Group [s/veh]       | 33.29  | 9.65   | 7.28  | 30.62  | 7.54   | 5.75 | 46.28 | 42.36 | 46.97  | 38.37  | 34.17 | 33.91 |
| Lane Group LOS                        | C      | A      | A     | C      | A      | A    | D     | D     | D      | D      | C     | C     |
| Critical Lane Group                   | Yes    | No     | No    | No     | No     | No   | No    | No    | Yes    | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 7.68   | 5.49   | 1.77  | 2.44   | 2.66   | 0.11 | 0.68  | 1.21  | 2.46   | 4.02   | 1.34  | 0.92  |
| 50th-Percentile Queue Length [ft/ln]  | 192.04 | 137.16 | 44.17 | 60.96  | 66.44  | 2.77 | 16.90 | 30.27 | 61.49  | 100.62 | 33.50 | 22.90 |
| 95th-Percentile Queue Length [veh/ln] | 12.23  | 9.33   | 3.18  | 4.39   | 4.78   | 0.20 | 1.22  | 2.18  | 4.43   | 7.24   | 2.41  | 1.65  |
| 95th-Percentile Queue Length [ft/ln]  | 305.67 | 233.20 | 79.51 | 109.73 | 119.59 | 4.99 | 30.43 | 54.48 | 110.69 | 181.12 | 60.30 | 41.21 |

**Movement, Approach, & Intersection Results**

|                                 |       |      |      |       |      |      |       |       |       |       |       |       |
|---------------------------------|-------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 33.29 | 9.65 | 7.28 | 30.62 | 7.54 | 5.75 | 46.28 | 42.36 | 46.97 | 38.37 | 34.17 | 33.91 |
| Movement LOS                    | C     | A    | A    | C     | A    | A    | D     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 13.78 |      |      | 10.48 |      |      | 45.52 |       |       | 37.36 |       |       |
| Approach LOS                    | B     |      |      | B     |      |      | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 17.93 |      |      |       |      |      |       |       |       |       |       |       |
| Intersection LOS                | B     |      |      |       |      |      |       |       |       |       |       |       |
| Intersection V/C                | 0.660 |      |      |       |      |      |       |       |       |       |       |       |

**Emissions**

|                              |        |         |        |        |        |       |       |       |        |        |        |       |
|------------------------------|--------|---------|--------|--------|--------|-------|-------|-------|--------|--------|--------|-------|
| Vehicle Miles Traveled [mph] | 144.31 | 517.57  | 104.25 | 11.23  | 73.80  | 1.85  | 2.75  | 5.21  | 9.84   | 77.68  | 13.99  | 9.61  |
| Stops [stops/h]              | 276.53 | 395.03  | 63.60  | 87.78  | 191.35 | 3.99  | 24.34 | 43.58 | 88.55  | 289.80 | 48.24  | 32.97 |
| Fuel consumption [US gal/h]  | 12.36  | 27.14   | 5.05   | 2.72   | 7.18   | 0.16  | 0.66  | 1.18  | 2.39   | 9.17   | 1.55   | 1.06  |
| CO [g/h]                     | 863.65 | 1896.87 | 352.74 | 190.32 | 502.05 | 11.08 | 46.19 | 82.30 | 167.35 | 640.99 | 108.01 | 73.85 |
| NOx [g/h]                    | 168.03 | 369.06  | 68.63  | 37.03  | 97.68  | 2.16  | 8.99  | 16.01 | 32.56  | 124.71 | 21.02  | 14.37 |
| VOC [g/h]                    | 200.16 | 439.62  | 81.75  | 44.11  | 116.36 | 2.57  | 10.70 | 19.07 | 38.78  | 148.56 | 25.03  | 17.12 |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  | 0.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  | 0.000 |  |  |
| Crosswalk LOS                                            | F     |  |  | F     |  |  | F     |  |  | F     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1270  |  |  | 1270  |  |  | 260   |  |  | 440   |  |  |
| d_b, Bicycle Delay [s]                                   | 6.66  |  |  | 6.66  |  |  | 37.85 |  |  | 30.42 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 3.286 |  |  | 2.307 |  |  | 2.000 |  |  | 2.426 |  |  |
| Bicycle LOS                                              | C     |  |  | B     |  |  | B     |  |  | B     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 23.2  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.467 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | No                                                                                  |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 124         | 449    | 370    | 111         | 364    | 58     | 35             | 44     | 84     | 287            | 58     | 40     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.1280      | 1.1280 | 1.1280 | 1.1280      | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 | 1.1280         | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 10     | 3      | 0           | 17     | 17     | 10             | 3      | 0      | 5              | 5      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 210    | 0           | 0      | 41     | 0              | 0      | 48     | 0              | 0      | 23     |
| Total Hourly Volume [veh/h]                 | 140         | 516    | 210    | 125         | 428    | 41     | 49             | 53     | 47     | 329            | 70     | 22     |
| Peak Hour Factor                            | 0.8500      | 0.8500 | 0.8500 | 0.8500      | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 | 0.8500         | 0.8500 | 0.8500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 41          | 152    | 62     | 37          | 126    | 12     | 14             | 16     | 14     | 97             | 21     | 6      |
| Total Analysis Volume [veh/h]               | 165         | 607    | 247    | 147         | 504    | 48     | 58             | 62     | 55     | 387            | 82     | 26     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 80                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 0       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 0       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 0.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 0.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 0.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 0.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |     |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|-----|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 20   | 50  | 0   | 0   | 30  | 0   | 9    | 16  | 0   | 14   | 21  | 0   |
| Lead / Lag            | Lead | -   | -   | -   | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 0   | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     |     | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C    | R    | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 80    | 80   | 80   | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    | 80    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00 | 7.00 | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00 | 0.00 | 2.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00 | 5.00 | 5.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 9     | 44   | 44   | 31    | 31    | 31    | 23    | 9     | 9     | 10    | 16    | 16    |
| g / C, Green / Cycle                    | 0.12  | 0.55 | 0.55 | 0.38  | 0.38  | 0.38  | 0.29  | 0.12  | 0.12  | 0.13  | 0.20  | 0.20  |
| (v / s)_i Volume / Saturation Flow Rate | 0.09  | 0.17 | 0.16 | 0.23  | 0.14  | 0.03  | 0.04  | 0.03  | 0.03  | 0.11  | 0.04  | 0.02  |
| s, saturation flow rate [veh/h]         | 1781  | 3560 | 1589 | 646   | 3560  | 1589  | 1406  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 207   | 1946 | 869  | 255   | 1354  | 605   | 495   | 217   | 184   | 432   | 365   | 310   |
| d1, Uniform Delay [s]                   | 34.44 | 9.92 | 9.74 | 28.73 | 17.89 | 15.84 | 20.84 | 32.33 | 32.38 | 34.48 | 27.10 | 26.34 |
| k, delay calibration                    | 0.11  | 0.50 | 0.50 | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 6.88  | 0.42 | 0.82 | 9.18  | 0.79  | 0.26  | 0.10  | 0.72  | 0.89  | 6.72  | 0.31  | 0.11  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00 | 0.00 | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00 | 1.00 | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |        |        |       |       |       |       |        |       |       |
|---------------------------------------|--------|--------|-------|--------|--------|-------|-------|-------|-------|--------|-------|-------|
| X, volume / capacity                  | 0.80   | 0.31   | 0.28  | 0.58   | 0.37   | 0.08  | 0.12  | 0.29  | 0.30  | 0.90   | 0.22  | 0.08  |
| d, Delay for Lane Group [s/veh]       | 41.32  | 10.34  | 10.56 | 37.91  | 18.68  | 16.10 | 20.95 | 33.05 | 33.27 | 41.21  | 27.41 | 26.45 |
| Lane Group LOS                        | D      | B      | B     | D      | B      | B     | C     | C     | C     | D      | C     | C     |
| Critical Lane Group                   | Yes    | No     | No    | Yes    | No     | No    | No    | No    | Yes   | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 3.24   | 2.33   | 1.97  | 3.03   | 3.00   | 0.52  | 0.77  | 1.10  | 0.99  | 3.96   | 1.30  | 0.40  |
| 50th-Percentile Queue Length [ft/ln]  | 80.99  | 58.20  | 49.21 | 75.77  | 75.08  | 13.11 | 19.31 | 27.59 | 24.70 | 99.06  | 32.45 | 10.01 |
| 95th-Percentile Queue Length [veh/ln] | 5.83   | 4.19   | 3.54  | 5.46   | 5.41   | 0.94  | 1.39  | 1.99  | 1.78  | 7.13   | 2.34  | 0.72  |
| 95th-Percentile Queue Length [ft/ln]  | 145.78 | 104.77 | 88.59 | 136.38 | 135.15 | 23.60 | 34.77 | 49.66 | 44.46 | 178.31 | 58.41 | 18.01 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 41.32 | 10.34 | 10.56 | 37.91 | 18.68 | 16.10 | 20.95 | 33.05 | 33.27 | 41.21 | 27.41 | 26.45 |
| Movement LOS                    | D     | B     | B     | D     | B     | B     | C     | C     | C     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 15.41 |       |       | 22.55 |       |       | 29.11 |       |       | 38.15 |       |       |
| Approach LOS                    | B     |       |       | C     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 23.21 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.467 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

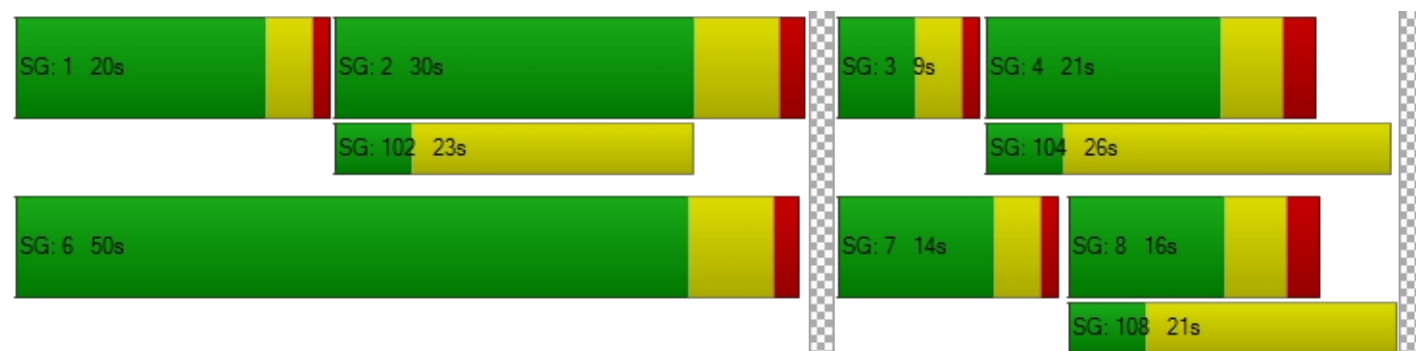
|                              |        |        |        |        |        |       |       |        |       |        |       |       |
|------------------------------|--------|--------|--------|--------|--------|-------|-------|--------|-------|--------|-------|-------|
| Vehicle Miles Traveled [mph] | 54.23  | 199.51 | 81.19  | 36.48  | 125.06 | 11.91 | 19.02 | 20.33  | 18.03 | 59.02  | 12.51 | 3.97  |
| Stops [stops/h]              | 145.78 | 209.54 | 88.59  | 136.38 | 270.29 | 23.60 | 34.77 | 49.66  | 44.46 | 356.62 | 58.41 | 18.01 |
| Fuel consumption [US gal/h]  | 5.91   | 11.84  | 4.89   | 4.89   | 11.12  | 0.99  | 1.23  | 1.57   | 1.39  | 8.18   | 1.37  | 0.43  |
| CO [g/h]                     | 413.06 | 827.83 | 341.96 | 341.64 | 777.28 | 69.49 | 86.23 | 109.41 | 97.45 | 571.56 | 95.99 | 29.82 |
| NOx [g/h]                    | 80.37  | 161.06 | 66.53  | 66.47  | 151.23 | 13.52 | 16.78 | 21.29  | 18.96 | 111.21 | 18.68 | 5.80  |
| VOC [g/h]                    | 95.73  | 191.86 | 79.25  | 79.18  | 180.14 | 16.10 | 19.98 | 25.36  | 22.58 | 132.47 | 22.25 | 6.91  |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   | 9.0   | 9.0   | 0.0   |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 31.51 | 31.51 | 31.51 | 0.00  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.410 | 2.958 | 2.354 | 0.000 |
| Crosswalk LOS                                            | C     | C     | B     | F     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 1075  | 575   | 250   | 375   |
| d_b, Bicycle Delay [s]                                   | 8.56  | 20.31 | 30.63 | 26.41 |
| I_b,int, Bicycle LOS Score for Intersection              | 2.574 | 2.170 | 1.928 | 2.414 |
| Bicycle LOS                                              | B     | B     | A     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 11.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.009 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 3                | 1      | 142            | 1      | 6              | 168    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280         | 1.1280 | 1.1280         | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 1                | 13     | 0              | 2      | 22             | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 4                | 14     | 160            | 3      | 29             | 190    |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500         | 0.8500 | 0.8500         | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 1                | 4      | 47             | 1      | 9              | 56     |
| Total Analysis Volume [veh/h]           | 5                | 16     | 188            | 4      | 34             | 224    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        | No   |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01  | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 11.93 | 9.37 | 0.00 | 0.00 | 7.67 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.09  | 0.09 | 0.00 | 0.00 | 0.08 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 2.18  | 2.18 | 0.00 | 0.00 | 1.89 | 0.00 |
| d_A, Approach Delay [s/veh]           | 9.98  |      | 0.00 |      | 1.01 |      |
| Approach LOS                          | A     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.00  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 13.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.160 |

#### Intersection Setup

| Name                         | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Approach                     | Southbound       |        | Eastbound    |        | Westbound    |        |
| Lane Configuration           |                  |        |              |        |              |        |
| Turning Movement             | Left             | Right  | Left         | Thru   | Thru         | Right  |
| Lane Width [ft]              | 12.00            | 12.00  | 12.00        | 12.00  | 12.00        | 12.00  |
| No. of Lanes in Entry Pocket | 1                | 0      | 0            | 0      | 0            | 1      |
| Entry Pocket Length [ft]     | 250.00           | 100.00 | 100.00       | 100.00 | 100.00       | 115.00 |
| No. of Lanes in Exit Pocket  | 0                | 0      | 0            | 0      | 0            | 0      |
| Exit Pocket Length [ft]      | 0.00             | 0.00   | 0.00         | 0.00   | 0.00         | 0.00   |
| Speed [mph]                  | 30.00            |        | 45.00        |        | 45.00        |        |
| Grade [%]                    | 0.00             |        | 0.00         |        | 0.00         |        |
| Crosswalk                    | Yes              |        | Yes          |        | Yes          |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Stapleton Dr |        | Stapleton Dr |        |
|-----------------------------------------|------------------|--------|--------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 25               | 1      | 1            | 151    | 236          | 57     |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00         | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280       | 1.1280 | 1.1280       | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0            | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 42               | 1      | 2            | 0      | 0            | 71     |
| Diverted Trips [veh/h]                  | 0                | 0      | 0            | 0      | 0            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0            | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0            | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0            | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 70               | 2      | 3            | 170    | 266          | 135    |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500       | 0.8500 | 0.8500       | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000       | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 21               | 1      | 1            | 50     | 78           | 40     |
| Total Analysis Volume [veh/h]           | 82               | 2      | 4            | 200    | 313          | 159    |
| Pedestrian Volume [ped/h]               | 0                |        | 0            |        | 0            |        |

**Intersection Settings**

| Priority Scheme                    | Stop | Free | Free |
|------------------------------------|------|------|------|
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.16  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 13.34 | 9.96 | 8.31 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.56  | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 14.10 | 0.21 | 0.17 | 0.17 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 13.26 |      | 0.16 |      | 0.00 |      |
| Approach LOS                          | B     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.51  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 10.5  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.038 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        |        |                                                                                   |        |        | Waterbury Dr                                                                        |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        |        |        |        |        | Waterbury Dr |        |        |        |        |        |
|-----------------------------------------|------------------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 15               | 43     | 0      | 0      | 21     | 0      | 0            | 0      | 5      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.1280           | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280       | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]               | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                | 37     | 37     | 12     | 22     | 0      | 0            | 0      | 0      | 22     | 0      | 7      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 17               | 86     | 37     | 12     | 46     | 0      | 0            | 0      | 6      | 22     | 0      | 7      |
| Peak Hour Factor                        | 0.8500           | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500       | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 5                | 25     | 11     | 4      | 14     | 0      | 0            | 0      | 2      | 6      | 0      | 2      |
| Total Analysis Volume [veh/h]           | 20               | 101    | 44     | 14     | 54     | 0      | 0            | 0      | 7      | 26     | 0      | 8      |
| Pedestrian Volume [ped/h]               | 0                |        |        | 0      |        |        | 0            |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |       |       |      |       |       |      |
|---------------------------------------|------|------|------|------|------|------|-------|-------|------|-------|-------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00  | 0.00  | 0.01 | 0.04  | 0.00  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.35 | 0.00 | 0.00 | 7.52 | 0.00 | 0.00 | 10.31 | 10.80 | 8.58 | 10.51 | 10.86 | 9.12 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | B     | B     | A    | B     | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.04 | 0.04 | 0.04 | 0.02 | 0.02 | 0.02 | 0.02  | 0.02  | 0.02 | 0.15  | 0.15  | 0.15 |
| 95th-Percentile Queue Length [ft/ln]  | 0.89 | 0.89 | 0.89 | 0.59 | 0.59 | 0.59 | 0.52  | 0.52  | 0.52 | 3.67  | 3.67  | 3.67 |
| d_A, Approach Delay [s/veh]           | 0.89 |      |      | 1.55 |      |      | 8.58  |       |      | 10.18 |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | A     |       |      | B     |       |      |
| d_I, Intersection Delay [s/veh]       | 2.40 |      |      |      |      |      |       |       |      |       |       |      |
| Intersection LOS                      | B    |      |      |      |      |      |       |       |      |       |       |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

Control Type: Two-way stop  
 Analysis Method: HCM 7th Edition  
 Analysis Period: 15 minutes

Delay (sec / veh): 9.8  
 Level Of Service: A  
 Volume to Capacity (v/c): 0.033

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Salem Ct                                                                            |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 25.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Salem Ct |        |        |        |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 9      | 36     | 0      | 0                | 17     | 2      | 2        | 0      | 3      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00             | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.1280 | 1.1280 | 1.1280 | 1.1280           | 1.1280 | 1.1280 | 1.1280   | 1.1280 | 1.1280 | 1.1280 | 1.1280 | 1.1280 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 7      | 37     | 12               | 12     | 0      | 0        | 0      | 0      | 22     | 0      | 7      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 10     | 48     | 37     | 12               | 31     | 2      | 2        | 0      | 3      | 22     | 0      | 7      |
| Peak Hour Factor                        | 0.8500 | 0.8500 | 0.8500 | 0.8500           | 0.8500 | 0.8500 | 0.8500   | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3      | 14     | 11     | 4                | 9      | 1      | 1        | 0      | 1      | 6      | 0      | 2      |
| Total Analysis Volume [veh/h]           | 12     | 56     | 44     | 14               | 36     | 2      | 2        | 0      | 4      | 26     | 0      | 8      |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0        |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |      |       |      |      |       |      |
|---------------------------------------|------|------|------|------|------|------|------|-------|------|------|-------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00 | 0.03 | 0.00  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 7.31 | 0.00 | 0.00 | 7.43 | 0.00 | 0.00 | 9.69 | 10.22 | 8.50 | 9.82 | 10.25 | 8.85 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | A    | B     | A    | A    | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02  | 0.02 | 0.13 | 0.13  | 0.13 |
| 95th-Percentile Queue Length [ft/ln]  | 0.55 | 0.55 | 0.55 | 0.59 | 0.59 | 0.59 | 0.49 | 0.49  | 0.49 | 3.25 | 3.25  | 3.25 |
| d_A, Approach Delay [s/veh]           | 0.78 |      |      | 2.00 |      |      | 8.90 |       |      | 9.59 |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | A    |       |      | A    |       |      |
| d_I, Intersection Delay [s/veh]       | 2.80 |      |      |      |      |      |      |       |      |      |       |      |
| Intersection LOS                      | A    |      |      |      |      |      |      |       |      |      |       |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 219           | 163 | 18            |
| 2    | 212           | 158 | 17            |
| 3    | 208           | 155 | 17            |
| 4    | 195           | 145 | 16            |
| 5    | 173           | 129 | 14            |
| 6    | 171           | 127 | 14            |
| 7    | 169           | 126 | 14            |
| 8    | 153           | 114 | 13            |
| 9    | 151           | 112 | 12            |
| 10   | 149           | 111 | 12            |
| 11   | 129           | 96  | 11            |
| 12   | 120           | 90  | 10            |
| 13   | 118           | 88  | 10            |
| 14   | 88            | 65  | 7             |
| 15   | 88            | 65  | 7             |
| 16   | 61            | 46  | 5             |
| 17   | 35            | 26  | 3             |
| 18   | 35            | 26  | 3             |
| 19   | 20            | 15  | 2             |
| 20   | 11            | 8   | 1             |
| 21   | 7             | 5   | 1             |
| 22   | 2             | 2   | 0             |
| 23   | 2             | 2   | 0             |
| 24   | 2             | 2   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 382    | 1            | 18     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 370    | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 363    | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 340    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 302    | 1            | 14     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 298    | 1            | 14     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 295    | 1            | 14     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 267    | 1            | 13     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 263    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 260    | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 225    | 1            | 11     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 210    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 206    | 1            | 10     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 153    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 153    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 107    | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 61     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 61     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 35     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 19     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 12     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                           |           |
|-----------------------------------------------------------|-----------|
| Orientation                                               | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)     | 10        |
| Number of Lanes on Minor Street Approach                  | 1         |
| VehicleHours of Stopped Delay on Minor Approach ([h]h:mm) | 0:02      |
| Delay Condition Met                                       | No        |
| Volume on Minor Street Approach During Same Hour          | 18        |
| High Minor Volume Condition Met                           | No        |
| Total Entering Volume on All Approaches During Same Hour  | 400       |
| Number of Approaches on Intersection                      | 3         |
| Total Volume Condition Met                                | No        |
| Warrant Met for Approach                                  | No        |
| <b>Warrant Met for Intersection</b>                       | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | N    |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | N             |
| 1    | 401           | 173 | 72            |
| 2    | 389           | 168 | 70            |
| 3    | 381           | 164 | 68            |
| 4    | 357           | 154 | 64            |
| 5    | 317           | 137 | 57            |
| 6    | 313           | 135 | 56            |
| 7    | 309           | 133 | 55            |
| 8    | 281           | 121 | 50            |
| 9    | 277           | 119 | 50            |
| 10   | 273           | 118 | 49            |
| 11   | 237           | 102 | 42            |
| 12   | 221           | 95  | 40            |
| 13   | 217           | 93  | 39            |
| 14   | 160           | 69  | 29            |
| 15   | 160           | 69  | 29            |
| 16   | 112           | 48  | 20            |
| 17   | 64            | 28  | 12            |
| 18   | 64            | 28  | 12            |
| 19   | 36            | 16  | 6             |
| 20   | 20            | 9   | 4             |
| 21   | 12            | 5   | 2             |
| 22   | 4             | 2   | 1             |
| 23   | 4             | 2   | 1             |
| 24   | 4             | 2   | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 574    | 2            | 72     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 2         | 2             | 557    | 2            | 70     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 3         | 2             | 545    | 2            | 68     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 4         | 2             | 511    | 2            | 64     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 5         | 2             | 454    | 2            | 57     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 448    | 2            | 56     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 442    | 2            | 55     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 402    | 2            | 50     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 396    | 2            | 50     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 391    | 2            | 49     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 339    | 2            | 42     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 316    | 2            | 40     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 310    | 2            | 39     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 229    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 229    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 160    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 92     | 2            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 92     | 2            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 52     | 2            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 29     | 2            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 17     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 6      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 4   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | N         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 13.3      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:15      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 72        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 646       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 140           | 58 | 29            | 6 |
| 2    | 136           | 56 | 28            | 6 |
| 3    | 133           | 55 | 28            | 6 |
| 4    | 125           | 52 | 26            | 5 |
| 5    | 111           | 46 | 23            | 5 |
| 6    | 109           | 45 | 23            | 5 |
| 7    | 108           | 45 | 22            | 5 |
| 8    | 98            | 41 | 20            | 4 |
| 9    | 97            | 40 | 20            | 4 |
| 10   | 95            | 39 | 20            | 4 |
| 11   | 83            | 34 | 17            | 4 |
| 12   | 77            | 32 | 16            | 3 |
| 13   | 76            | 31 | 16            | 3 |
| 14   | 56            | 23 | 12            | 2 |
| 15   | 56            | 23 | 12            | 2 |
| 16   | 39            | 16 | 8             | 2 |
| 17   | 22            | 9  | 5             | 1 |
| 18   | 22            | 9  | 5             | 1 |
| 19   | 13            | 5  | 3             | 1 |
| 20   | 7             | 3  | 1             | 0 |
| 21   | 4             | 2  | 1             | 0 |
| 22   | 1             | 1  | 0             | 0 |
| 23   | 1             | 1  | 0             | 0 |
| 24   | 1             | 1  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 198    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 192    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 188    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 177    | 1            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 157    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 154    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 153    | 1            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 139    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 137    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 134    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 117    | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 109    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 107    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 79     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 79     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 55     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 31     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 31     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 18     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 10     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 6      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 10.2      | 8.6  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      | 0:00 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 29        | 6    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 233       | 233  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 95            | 45 | 29            | 5 |
| 2    | 92            | 44 | 28            | 5 |
| 3    | 90            | 43 | 28            | 5 |
| 4    | 85            | 40 | 26            | 4 |
| 5    | 75            | 36 | 23            | 4 |
| 6    | 74            | 35 | 23            | 4 |
| 7    | 73            | 35 | 22            | 4 |
| 8    | 67            | 31 | 20            | 4 |
| 9    | 66            | 31 | 20            | 3 |
| 10   | 65            | 31 | 20            | 3 |
| 11   | 56            | 27 | 17            | 3 |
| 12   | 52            | 25 | 16            | 3 |
| 13   | 51            | 24 | 16            | 3 |
| 14   | 38            | 18 | 12            | 2 |
| 15   | 38            | 18 | 12            | 2 |
| 16   | 27            | 13 | 8             | 1 |
| 17   | 15            | 7  | 5             | 1 |
| 18   | 15            | 7  | 5             | 1 |
| 19   | 9             | 4  | 3             | 0 |
| 20   | 5             | 2  | 1             | 0 |
| 21   | 3             | 1  | 1             | 0 |
| 22   | 1             | 0  | 0             | 0 |
| 23   | 1             | 0  | 0             | 0 |
| 24   | 1             | 0  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 140    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 136    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 133    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 125    | 1            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 111    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 109    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 108    | 1            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 98     | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 97     | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 96     | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 83     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 77     | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 75     | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 56     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 56     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 40     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 22     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 22     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 13     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 7      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 4      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.6       | 8.9  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      | 0:00 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 29        | 5    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 174       | 174  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## **Appendix E – Horizon Conditions Analyses**

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 42.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.729 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 2                                                                                 | 0      | 1      | 2                                                                                 | 0      | 1      | 2                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 2      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 157         | 346    | 141    | 110         | 980    | 9      | 15           | 75     | 252    | 350          | 145    | 155    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 36           | 48     | 56     | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 133    | 0           | 0      | 9      | 0            | 0      | 266    | 0            | 0      | 146    |
| Total Hourly Volume [veh/h]                 | 296         | 652    | 133    | 207         | 1847   | 8      | 64           | 189    | 265    | 660          | 273    | 146    |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 78          | 172    | 35     | 54          | 486    | 2      | 17           | 50     | 70     | 174          | 72     | 38     |
| Total Analysis Volume [veh/h]               | 312         | 686    | 140    | 218         | 1944   | 8      | 67           | 199    | 279    | 695          | 287    | 154    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 130                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Unsigna | Protecte | Permiss | Permiss | Protecte | Permiss | Unsigna | Protecte | Permiss | Unsigna |
|---------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5        | 2       | 0       | 3        | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |          |         |         |          |         |         |          |         |         |
| Maximum Green [s]               | 20       | 70      | 0       | 20       | 70      | 0       | 30       | 40      | 0       | 30       | 40      | 0       |
| Amber [s]                       | 4.0      | 5.5     | 0.0     | 4.0      | 5.5     | 0.0     | 3.0      | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 3.0      | 2.0     | 0.0     | 3.0      | 2.0     | 0.0     | 1.0      | 3.0     | 0.0     | 1.0      | 3.0     | 0.0     |
| Walk [s]                        | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]        | 0        | 29      | 0       | 0        | 29      | 0       | 0        | 15      | 0       | 0        | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0      | 5.5     | 0.0     | 5.0      | 5.5     | 0.0     | 2.0      | 5.0     | 0.0     | 2.0      | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 21   | 44  | 0   | 35   | 58  | 0   | 34   | 20  | 0   | 31   | 17  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 130   | 130   | 130   | 130   | 130   | 130   | 130   | 130   | 130   |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.50  | 7.00  | 7.50  | 7.50  | 4.00  | 7.00  | 4.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.50  | 5.00  | 5.50  | 5.50  | 2.00  | 5.00  | 2.00  | 5.00  |
| g_i, Effective Green Time [s]           | 14    | 57    | 11    | 54    | 54    | 5     | 10    | 27    | 32    |
| g / C, Green / Cycle                    | 0.10  | 0.44  | 0.08  | 0.41  | 0.41  | 0.04  | 0.08  | 0.21  | 0.25  |
| (v / s)_i Volume / Saturation Flow Rate | 0.09  | 0.13  | 0.06  | 0.38  | 0.01  | 0.02  | 0.06  | 0.20  | 0.08  |
| s, saturation flow rate [veh/h]         | 3459  | 5094  | 3459  | 5094  | 1589  | 3459  | 3560  | 3459  | 3560  |
| c, Capacity [veh/h]                     | 362   | 2228  | 283   | 2112  | 659   | 126   | 274   | 718   | 884   |
| d1, Uniform Delay [s]                   | 57.29 | 23.78 | 58.49 | 36.03 | 22.39 | 61.52 | 58.65 | 51.07 | 39.96 |
| k, delay calibration                    | 0.11  | 0.50  | 0.11  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 6.15  | 0.36  | 4.44  | 8.06  | 0.03  | 3.41  | 3.64  | 9.70  | 0.21  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |       |        |        |        |
|---------------------------------------|--------|--------|--------|--------|-------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.86   | 0.31   | 0.77   | 0.92   | 0.01  | 0.53  | 0.73   | 0.97   | 0.32   |
| d, Delay for Lane Group [s/veh]       | 63.44  | 24.14  | 62.93  | 44.09  | 22.42 | 64.93 | 62.29  | 60.76  | 40.17  |
| Lane Group LOS                        | E      | C      | E      | D      | C     | E     | E      | E      | D      |
| Critical Lane Group                   | Yes    | No     | No     | Yes    | No    | No    | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.16   | 4.38   | 3.57   | 19.51  | 0.14  | 1.13  | 3.28   | 11.86  | 3.70   |
| 50th-Percentile Queue Length [ft/ln]  | 129.10 | 109.41 | 89.14  | 487.85 | 3.59  | 28.19 | 81.90  | 296.50 | 92.58  |
| 95th-Percentile Queue Length [veh/ln] | 8.89   | 7.81   | 6.42   | 26.76  | 0.26  | 2.03  | 5.90   | 17.51  | 6.67   |
| 95th-Percentile Queue Length [ft/ln]  | 222.27 | 195.18 | 160.45 | 668.96 | 6.47  | 50.74 | 147.41 | 437.69 | 166.65 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |      |       |       |      |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 63.44 | 24.14 | 0.00 | 62.93 | 44.09 | 22.42 | 64.93 | 62.29 | 0.00 | 60.76 | 40.17 | 0.00 |
| Movement LOS                    | E     | C     |      | E     | D     | C     | E     | E     |      | E     | D     |      |
| d_A, Approach Delay [s/veh]     | 32.14 |       |      | 45.91 |       |       | 31.54 |       |      | 47.66 |       |      |
| Approach LOS                    | C     |       |      | D     |       |       | C     |       |      | D     |       |      |
| d_I, Intersection Delay [s/veh] | 42.32 |       |      |       |       |       |       |       |      |       |       |      |
| Intersection LOS                | D     |       |      |       |       |       |       |       |      |       |       |      |
| Intersection V/C                | 0.729 |       |      |       |       |       |       |       |      |       |       |      |

**Emissions**

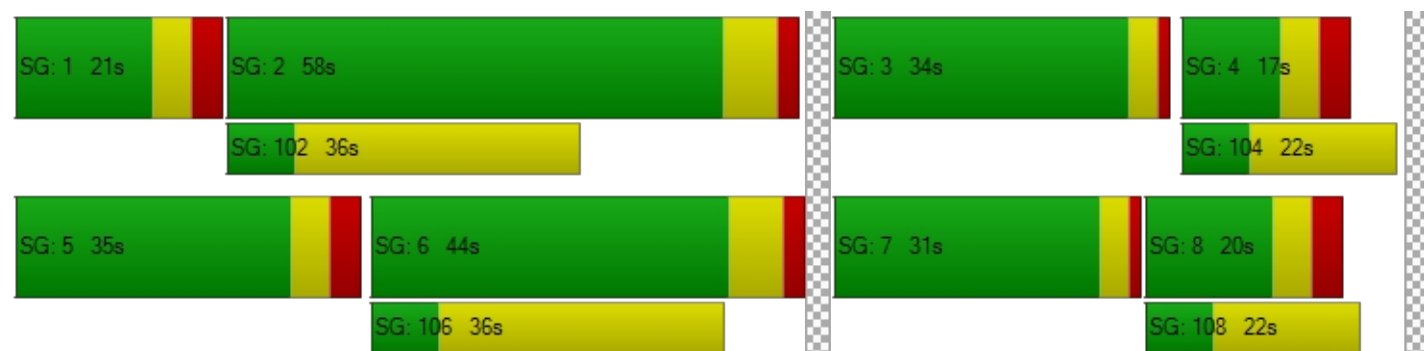
|                              |        |        |        |         |      |        |        |         |        |
|------------------------------|--------|--------|--------|---------|------|--------|--------|---------|--------|
| Vehicle Miles Traveled [mph] | 42.00  | 92.35  | 21.28  | 189.77  | 0.78 | 6.59   | 19.58  | 145.12  | 59.93  |
| Stops [stops/h]              | 286.01 | 363.58 | 197.48 | 1621.16 | 3.98 | 62.45  | 181.43 | 656.85  | 205.10 |
| Fuel consumption [US gal/h]  | 10.74  | 13.21  | 7.17   | 53.90   | 0.14 | 1.89   | 5.45   | 21.73   | 6.95   |
| CO [g/h]                     | 751.06 | 923.54 | 501.29 | 3767.77 | 9.55 | 131.94 | 380.88 | 1519.23 | 485.84 |
| NOx [g/h]                    | 146.13 | 179.69 | 97.53  | 733.07  | 1.86 | 25.67  | 74.11  | 295.59  | 94.53  |
| VOC [g/h]                    | 174.06 | 214.04 | 116.18 | 873.22  | 2.21 | 30.58  | 88.27  | 352.10  | 112.60 |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  | 11.0  | 11.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 54.47 | 54.47 | 54.47 | 54.47 |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.634 | 3.462 | 2.904 | 2.999 |
| Crosswalk LOS                                            | D     | C     | C     | C     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 562   | 777   | 200   | 154   |
| d_b, Bicycle Delay [s]                                   | 33.62 | 24.31 | 52.65 | 55.38 |
| I_b,int, Bicycle LOS Score for Intersection              | 2.109 | 2.758 | 1.779 | 2.370 |
| Bicycle LOS                                              | B     | C     | A     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 41.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.730 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 640.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 98          | 328    | 109    | 70          | 411    | 57     | 102            | 131    | 263    | 397            | 176    | 169    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 103    | 0           | 0      | 54     | 0              | 0      | 248    | 0              | 0      | 160    |
| Total Hourly Volume [veh/h]                 | 185         | 618    | 102    | 132         | 775    | 53     | 192            | 247    | 248    | 748            | 332    | 159    |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 49          | 163    | 27     | 35          | 204    | 14     | 51             | 65     | 65     | 197            | 87     | 42     |
| Total Analysis Volume [veh/h]               | 195         | 651    | 107    | 139         | 816    | 56     | 202            | 260    | 261    | 787            | 349    | 167    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 100                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 5       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 3.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 1.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 19   | 39  | 0   | 10   | 30  | 0   | 12   | 24  | 0   | 27   | 39  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 13    | 32    | 32    | 42    | 25    | 25    | 45    | 18    | 18    | 23    | 33    | 33    |
| g / C, Green / Cycle                    | 0.13  | 0.32  | 0.32  | 0.42  | 0.25  | 0.25  | 0.45  | 0.18  | 0.18  | 0.23  | 0.33  | 0.33  |
| (v / s)_i Volume / Saturation Flow Rate | 0.11  | 0.18  | 0.07  | 0.15  | 0.23  | 0.04  | 0.19  | 0.14  | 0.16  | 0.23  | 0.19  | 0.11  |
| s, saturation flow rate [veh/h]         | 1781  | 3560  | 1589  | 911   | 3560  | 1589  | 1084  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 229   | 1139  | 509   | 383   | 896   | 400   | 459   | 337   | 286   | 795   | 617   | 525   |
| d1, Uniform Delay [s]                   | 42.65 | 28.29 | 24.79 | 19.68 | 36.34 | 29.03 | 18.59 | 39.05 | 40.23 | 38.38 | 27.60 | 25.08 |
| k, delay calibration                    | 0.22  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 16.15 | 2.08  | 0.94  | 2.65  | 14.99 | 0.73  | 3.04  | 3.78  | 11.04 | 12.55 | 0.82  | 0.35  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |       |        |       |        |        |        |        |        |        |
|---------------------------------------|--------|--------|-------|-------|--------|-------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.85   | 0.57   | 0.21  | 0.36  | 0.91   | 0.14  | 0.44   | 0.77   | 0.91   | 0.99   | 0.57   | 0.32   |
| d, Delay for Lane Group [s/veh]       | 58.79  | 30.38  | 25.73 | 22.33 | 51.33  | 29.76 | 21.63  | 42.83  | 51.27  | 50.93  | 28.41  | 25.43  |
| Lane Group LOS                        | E      | C      | C     | C     | D      | C     | C      | D      | D      | D      | C      | C      |
| Critical Lane Group                   | Yes    | No     | No    | No    | Yes    | No    | No     | No     | Yes    | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.45   | 6.25   | 1.84  | 2.10  | 10.73  | 1.05  | 3.16   | 6.29   | 7.02   | 10.70  | 6.79   | 2.94   |
| 50th-Percentile Queue Length [ft/ln]  | 136.25 | 156.30 | 45.96 | 52.62 | 268.35 | 26.35 | 79.00  | 157.32 | 175.48 | 267.45 | 169.77 | 73.57  |
| 95th-Percentile Queue Length [veh/ln] | 9.28   | 10.35  | 3.31  | 3.79  | 16.11  | 1.90  | 5.69   | 10.41  | 11.36  | 16.06  | 11.06  | 5.30   |
| 95th-Percentile Queue Length [ft/ln]  | 231.96 | 258.82 | 82.74 | 94.72 | 402.68 | 47.43 | 142.20 | 260.17 | 284.10 | 401.55 | 276.62 | 132.43 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 58.79 | 30.38 | 25.73 | 22.33 | 51.33 | 29.76 | 21.63 | 42.83 | 51.27 | 50.93 | 28.41 | 25.43 |
| Movement LOS                    | E     | C     | C     | C     | D     | C     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 35.67 |       |       | 46.15 |       |       | 39.95 |       |       | 41.63 |       |       |
| Approach LOS                    | D     |       |       | D     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 41.05 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.730 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

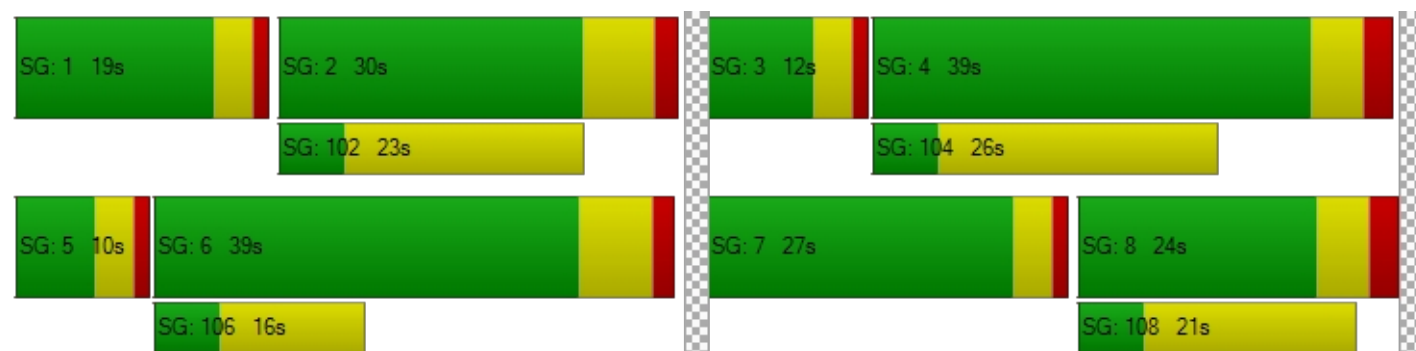
|                              |        |         |        |        |         |        |        |        |        |         |        |        |
|------------------------------|--------|---------|--------|--------|---------|--------|--------|--------|--------|---------|--------|--------|
| Vehicle Miles Traveled [mph] | 64.09  | 213.98  | 35.17  | 34.49  | 202.48  | 13.90  | 66.23  | 85.25  | 85.58  | 120.03  | 53.23  | 25.47  |
| Stops [stops/h]              | 196.19 | 450.16  | 66.19  | 75.78  | 772.85  | 37.94  | 113.76 | 226.54 | 252.69 | 770.24  | 244.47 | 105.94 |
| Fuel consumption [US gal/h]  | 8.12   | 19.54   | 2.97   | 3.19   | 29.65   | 1.51   | 4.27   | 7.22   | 7.89   | 18.52   | 5.89   | 2.63   |
| CO [g/h]                     | 567.67 | 1366.09 | 207.33 | 223.19 | 2072.62 | 105.46 | 298.42 | 504.62 | 551.17 | 1294.80 | 411.38 | 183.95 |
| NOx [g/h]                    | 110.45 | 265.79  | 40.34  | 43.43  | 403.26  | 20.52  | 58.06  | 98.18  | 107.24 | 251.92  | 80.04  | 35.79  |
| VOC [g/h]                    | 131.56 | 316.60  | 48.05  | 51.73  | 480.35  | 24.44  | 69.16  | 116.95 | 127.74 | 300.08  | 95.34  | 42.63  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 41.41 |  |  | 41.41 |  |  | 41.41 |  |  | 41.41 |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.556 |  |  | 3.351 |  |  | 2.953 |  |  | 3.147 |  |  |
| Crosswalk LOS                                            | D     |  |  | C     |  |  | C     |  |  | C     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 640   |  |  | 460   |  |  | 360   |  |  | 660   |  |  |
| d_b, Bicycle Delay [s]                                   | 23.12 |  |  | 29.65 |  |  | 33.62 |  |  | 22.45 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.431 |  |  | 2.438 |  |  | 3.162 |  |  | 3.974 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | C     |  |  | D     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 40.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | E     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.121 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 7                | 6      | 489            | 15     | 4              | 300    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850         | 1.8850 | 1.8850         | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0              | 0      | 0              | 0      |
| Diverted Trips [veh/h]                  | 0                | 35     | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 13               | 46     | 922            | 28     | 8              | 566    |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500         | 0.9500 | 0.9500         | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3                | 12     | 243            | 7      | 2              | 149    |
| Total Analysis Volume [veh/h]           | 14               | 48     | 971            | 29     | 8              | 596    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |       |      |
|---------------------------------------|-------|-------|------|------|-------|------|
| V/C, Movement V/C Ratio               | 0.12  | 0.16  | 0.01 | 0.00 | 0.01  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 40.34 | 19.22 | 0.00 | 0.00 | 10.26 | 0.00 |
| Movement LOS                          | E     | C     | A    | A    | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.40  | 0.56  | 0.00 | 0.00 | 0.04  | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 10.01 | 13.99 | 0.00 | 0.00 | 0.88  | 0.00 |
| d_A, Approach Delay [s/veh]           | 23.99 |       | 0.00 |      | 0.14  |      |
| Approach LOS                          | C     |       | A    |      | A     |      |
| d_I, Intersection Delay [s/veh]       | 0.94  |       |      |      |       |      |
| Intersection LOS                      | E     |       |      |      |       |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 12.7  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.273 |

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 0      | 0      | 0      | 0                | 0      | 17     | 0            | 293    | 0      | 0            | 294    | 13     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 0.00   | 2.00   | 2.00             | 0.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 166    | 0                | 0      | 0      | 0            | 0      | 125    | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 0      | 0      | 166    | 0                | 0      | 32     | 0            | 552    | 125    | 0            | 554    | 25     |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 0      | 0      | 44     | 0                | 0      | 8      | 0            | 145    | 33     | 0            | 146    | 7      |
| Total Analysis Volume [veh/h]           | 0      | 0      | 175    | 0                | 0      | 34     | 0            | 581    | 132    | 0            | 583    | 26     |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Stop | Stop | Free | Free |
| Flared Lane                        |      |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |       |       |      |       |      |      |      |      |      |      |
|---------------------------------------|-------|------|-------|-------|------|-------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00  | 0.00 | 0.27  | 0.00  | 0.00 | 0.05  | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 0.00  | 0.00 | 12.73 | 0.00  | 0.00 | 10.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          |       |      | B     |       |      | B     |      | A    | A    |      | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00  | 0.00 | 1.11  | 0.00  | 0.00 | 0.15  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.00  | 0.00 | 27.70 | 0.00  | 0.00 | 3.79  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 12.73 |      |       | 10.37 |      |       | 0.00 |      |      | 0.00 |      |      |
| Approach LOS                          | B     |      |       | B     |      |       | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 1.69  |      |       |       |      |       |      |      |      |      |      |      |
| Intersection LOS                      | B     |      |       |       |      |       |      |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.3   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.008 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Southbound                                                                          |        | Waterbury Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 30.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Southbound |        | Waterbury Dr |        |
|-----------------------------------------|------------------|--------|------------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 7                | 13     | 41         | 0      | 0            | 0      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00       | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850     | 1.8850 | 1.8850       | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0          | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0          | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0          | 0      | 7            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0          | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0          | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0          | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 13               | 25     | 77         | 0      | 7            | 0      |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500     | 0.9500 | 0.9500       | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000     | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3                | 7      | 20         | 0      | 2            | 0      |
| Total Analysis Volume [veh/h]           | 14               | 26     | 81         | 0      | 7            | 0      |
| Pedestrian Volume [ped/h]               | 0                |        | 0          |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 7.39 | 0.00 | 0.00 | 0.00 | 9.27 | 8.71 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.00 | 0.00 | 0.02 | 0.02 |
| 95th-Percentile Queue Length [ft/ln]  | 0.59 | 0.59 | 0.00 | 0.00 | 0.62 | 0.62 |
| d_A, Approach Delay [s/veh]           | 2.59 |      | 0.00 |      | 9.27 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.32 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.1   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.009 |

#### Intersection Setup

| Name                         |                                                                                   |        | Liberty Grove Dr                                                                    |        | Salem Ct                                                                            |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 25.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    |        |        | Liberty Grove Dr |        | Salem Ct |        |
|-----------------------------------------|--------|--------|------------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 3      | 10     | 34               | 1      | 1        | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00             | 2.00   | 2.00     | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850   | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0                | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0                | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 7      | 0                | 0      | 6        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0                | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0                | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0                | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 6      | 26     | 64               | 2      | 8        | 0      |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500   | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2      | 7      | 17               | 1      | 2        | 0      |
| Total Analysis Volume [veh/h]           | 6      | 27     | 67               | 2      | 8        | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0                |        | 0        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 7.36 | 0.00 | 0.00 | 0.00 | 9.10 | 8.65 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.01 | 0.01 | 0.00 | 0.00 | 0.03 | 0.03 |
| 95th-Percentile Queue Length [ft/ln]  | 0.25 | 0.25 | 0.00 | 0.00 | 0.68 | 0.68 |
| d_A, Approach Delay [s/veh]           | 1.34 |      | 0.00 |      | 9.10 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.06 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 574           | 950 | 59            |
| 2    | 557           | 922 | 57            |
| 3    | 545           | 903 | 56            |
| 4    | 511           | 846 | 53            |
| 5    | 453           | 751 | 47            |
| 6    | 448           | 741 | 46            |
| 7    | 442           | 732 | 45            |
| 8    | 402           | 665 | 41            |
| 9    | 396           | 656 | 41            |
| 10   | 390           | 646 | 40            |
| 11   | 339           | 561 | 35            |
| 12   | 316           | 523 | 32            |
| 13   | 310           | 513 | 32            |
| 14   | 230           | 380 | 24            |
| 15   | 230           | 380 | 24            |
| 16   | 161           | 266 | 17            |
| 17   | 92            | 152 | 9             |
| 18   | 92            | 152 | 9             |
| 19   | 52            | 86  | 5             |
| 20   | 29            | 48  | 3             |
| 21   | 17            | 29  | 2             |
| 22   | 6             | 10  | 1             |
| 23   | 6             | 10  | 1             |
| 24   | 6             | 10  | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 1524   | 2            | 59     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 2         | 2             | 1479   | 2            | 57     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 3         | 2             | 1448   | 2            | 56     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 4         | 2             | 1357   | 2            | 53     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 1204   | 2            | 47     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 1189   | 2            | 46     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 1174   | 2            | 45     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 1067   | 2            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 1052   | 2            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 1036   | 2            | 40     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 900    | 2            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 839    | 2            | 32     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 823    | 2            | 32     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 610    | 2            | 24     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 610    | 2            | 24     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 427    | 2            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 244    | 2            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 244    | 2            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 138    | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 77     | 2            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 46     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 16     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 16     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 16     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 3   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 24        |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:23      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 59        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 1583      |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | Yes  |
| #2      | Four Hour Vehicular Volume  | Yes  |
| #3      | Peak Hour                   | Yes  |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S, N |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |    |
|------|---------------|-----|---------------|----|
|      | E             | W   | S             | N  |
| 1    | 579           | 677 | 166           | 32 |
| 2    | 562           | 657 | 161           | 31 |
| 3    | 550           | 643 | 158           | 30 |
| 4    | 515           | 603 | 148           | 28 |
| 5    | 457           | 535 | 131           | 25 |
| 6    | 452           | 528 | 129           | 25 |
| 7    | 446           | 521 | 128           | 25 |
| 8    | 405           | 474 | 116           | 22 |
| 9    | 400           | 467 | 115           | 22 |
| 10   | 394           | 460 | 113           | 22 |
| 11   | 342           | 399 | 98            | 19 |
| 12   | 318           | 372 | 91            | 18 |
| 13   | 313           | 366 | 90            | 17 |
| 14   | 232           | 271 | 66            | 13 |
| 15   | 232           | 271 | 66            | 13 |
| 16   | 162           | 190 | 46            | 9  |
| 17   | 93            | 108 | 27            | 5  |
| 18   | 93            | 108 | 27            | 5  |
| 19   | 52            | 61  | 15            | 3  |
| 20   | 29            | 34  | 8             | 2  |
| 21   | 17            | 20  | 5             | 1  |
| 22   | 6             | 7   | 2             | 0  |
| 23   | 6             | 7   | 2             | 0  |
| 24   | 6             | 7   | 2             | 0  |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 3             | 1256   | 1            | 166    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 2         | 3             | 1219   | 1            | 161    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 3         | 3             | 1193   | 1            | 158    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 4         | 3             | 1118   | 1            | 148    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 5         | 3             | 992    | 1            | 131    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 6         | 3             | 980    | 1            | 129    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 7         | 3             | 967    | 1            | 128    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 8         | 3             | 879    | 1            | 116    | No                    | No  | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 9         | 3             | 867    | 1            | 115    | No                    | No  | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 10        | 3             | 854    | 1            | 113    | No                    | No  | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 11        | 3             | 741    | 1            | 98     | No                    | No  | No  | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 12        | 3             | 690    | 1            | 91     | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 13        | 3             | 679    | 1            | 90     | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 14        | 3             | 503    | 1            | 66     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 3             | 503    | 1            | 66     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 3             | 352    | 1            | 46     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 3             | 201    | 1            | 27     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 3             | 201    | 1            | 27     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 3             | 113    | 1            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 3             | 63     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 3             | 37     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 3             | 13     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 3             | 13     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 3             | 13     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 3                     | 7   | 10  | 13  | 7                     | 11  | 13  | 13  | 11        | 7           |

## Warrant 3 Condition A

| Orientation                                              | S         | N    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 12.7      | 10.4 |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:35      | 0:05 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 166       | 32   |
| High Minor Volume Condition Met                          | Yes       | No   |
| Total Entering Volume on All Approaches During Same Hour | 1454      | 1454 |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | Yes       | Yes  |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 38            | 77 | 7             |
| 2    | 37            | 75 | 7             |
| 3    | 36            | 73 | 7             |
| 4    | 34            | 69 | 6             |
| 5    | 30            | 61 | 6             |
| 6    | 30            | 60 | 5             |
| 7    | 29            | 59 | 5             |
| 8    | 27            | 54 | 5             |
| 9    | 26            | 53 | 5             |
| 10   | 26            | 52 | 5             |
| 11   | 22            | 45 | 4             |
| 12   | 21            | 42 | 4             |
| 13   | 21            | 42 | 4             |
| 14   | 15            | 31 | 3             |
| 15   | 15            | 31 | 3             |
| 16   | 11            | 22 | 2             |
| 17   | 6             | 12 | 1             |
| 18   | 6             | 12 | 1             |
| 19   | 3             | 7  | 1             |
| 20   | 2             | 4  | 0             |
| 21   | 1             | 2  | 0             |
| 22   | 0             | 1  | 0             |
| 23   | 0             | 1  | 0             |
| 24   | 0             | 1  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 115    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 112    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 109    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 103    | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 91     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 90     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 88     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 81     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 79     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 78     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 67     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 63     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 63     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 46     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 46     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 33     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 18     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 18     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 10     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 6      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.3       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 7         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 122       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 32            | 66 | 8             |
| 2    | 31            | 64 | 8             |
| 3    | 30            | 63 | 8             |
| 4    | 28            | 59 | 7             |
| 5    | 25            | 52 | 6             |
| 6    | 25            | 51 | 6             |
| 7    | 25            | 51 | 6             |
| 8    | 22            | 46 | 6             |
| 9    | 22            | 46 | 6             |
| 10   | 22            | 45 | 5             |
| 11   | 19            | 39 | 5             |
| 12   | 18            | 36 | 4             |
| 13   | 17            | 36 | 4             |
| 14   | 13            | 26 | 3             |
| 15   | 13            | 26 | 3             |
| 16   | 9             | 18 | 2             |
| 17   | 5             | 11 | 1             |
| 18   | 5             | 11 | 1             |
| 19   | 3             | 6  | 1             |
| 20   | 2             | 3  | 0             |
| 21   | 1             | 2  | 0             |
| 22   | 0             | 1  | 0             |
| 23   | 0             | 1  | 0             |
| 24   | 0             | 1  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 98     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 95     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 93     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 87     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 77     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 76     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 76     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 68     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 68     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 67     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 58     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 54     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 53     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 39     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 39     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 27     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 16     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 16     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 9      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 5      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.1       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 8         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 106       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

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**Intersection Level Of Service Report**  
**Intersection 1: Meridian Road/Stapleton Drive**

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 33.8  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.623 |

**Intersection Setup**

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 2                                                                                 | 0      | 1      | 2                                                                                 | 0      | 1      | 2                                                                                   | 0      | 1      | 3                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 275.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 2      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 231         | 954    | 386    | 87          | 570    | 9      | 10           | 35     | 131    | 280          | 42     | 70     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 66           | 71     | 49     | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 364    | 0           | 0      | 9      | 0            | 0      | 148    | 0            | 0      | 66     |
| Total Hourly Volume [veh/h]                 | 435         | 1798   | 364    | 164         | 1074   | 8      | 85           | 137    | 148    | 528          | 79     | 66     |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 114         | 473    | 96     | 43          | 283    | 2      | 22           | 36     | 39     | 139          | 21     | 17     |
| Total Analysis Volume [veh/h]               | 458         | 1893   | 383    | 173         | 1131   | 8      | 89           | 144    | 156    | 556          | 83     | 69     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 110                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Unsigna | Protecte | Permiss | Permiss | Protecte | Permiss | Unsigna | Protecte | Permiss | Unsigna |
|---------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5        | 2       | 0       | 3        | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |          |         |         |          |         |         |          |         |         |
| Maximum Green [s]               | 20       | 70      | 0       | 20       | 70      | 0       | 30       | 40      | 0       | 30       | 40      | 0       |
| Amber [s]                       | 4.0      | 5.5     | 0.0     | 4.0      | 5.5     | 0.0     | 3.0      | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 3.0      | 2.0     | 0.0     | 3.0      | 2.0     | 0.0     | 1.0      | 3.0     | 0.0     | 1.0      | 3.0     | 0.0     |
| Walk [s]                        | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]        | 0        | 29      | 0       | 0        | 29      | 0       | 0        | 15      | 0       | 0        | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0      | 5.5     | 0.0     | 5.0      | 5.5     | 0.0     | 2.0      | 5.0     | 0.0     | 2.0      | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 26   | 55  | 0   | 15   | 44  | 0   | 15   | 17  | 0   | 23   | 25  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.50  | 7.00  | 7.50  | 7.50  | 4.00  | 7.00  | 4.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.50  | 5.00  | 5.50  | 5.50  | 2.00  | 5.00  | 2.00  | 5.00  |
| g_i, Effective Green Time [s]           | 17    | 48    | 7     | 39    | 39    | 5     | 10    | 19    | 24    |
| g / C, Green / Cycle                    | 0.15  | 0.44  | 0.07  | 0.35  | 0.35  | 0.04  | 0.09  | 0.17  | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.13  | 0.37  | 0.05  | 0.22  | 0.01  | 0.03  | 0.04  | 0.16  | 0.02  |
| s, saturation flow rate [veh/h]         | 3459  | 5094  | 3459  | 5094  | 1589  | 3459  | 3560  | 3459  | 3560  |
| c, Capacity [veh/h]                     | 525   | 2233  | 233   | 1802  | 562   | 153   | 320   | 597   | 777   |
| d1, Uniform Delay [s]                   | 45.60 | 27.62 | 50.36 | 29.52 | 23.08 | 51.57 | 47.48 | 44.85 | 34.41 |
| k, delay calibration                    | 0.11  | 0.50  | 0.11  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 4.67  | 4.23  | 4.64  | 1.67  | 0.05  | 3.47  | 0.99  | 7.12  | 0.06  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |       |       |        |       |
|---------------------------------------|--------|--------|--------|--------|-------|-------|-------|--------|-------|
| X, volume / capacity                  | 0.87   | 0.85   | 0.74   | 0.63   | 0.01  | 0.58  | 0.45  | 0.93   | 0.11  |
| d, Delay for Lane Group [s/veh]       | 50.28  | 31.85  | 55.00  | 31.19  | 23.13 | 55.03 | 48.48 | 51.97  | 34.47 |
| Lane Group LOS                        | D      | C      | E      | C      | C     | E     | D     | D      | C     |
| Critical Lane Group                   | No     | Yes    | Yes    | No     | No    | No    | Yes   | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 6.12   | 14.07  | 2.38   | 7.90   | 0.13  | 1.25  | 1.86  | 7.78   | 0.87  |
| 50th-Percentile Queue Length [ft/ln]  | 153.04 | 351.73 | 59.48  | 197.38 | 3.34  | 31.15 | 46.58 | 194.58 | 21.72 |
| 95th-Percentile Queue Length [veh/ln] | 10.18  | 20.22  | 4.28   | 12.50  | 0.24  | 2.24  | 3.35  | 12.36  | 1.56  |
| 95th-Percentile Queue Length [ft/ln]  | 254.48 | 505.52 | 107.06 | 312.58 | 6.01  | 56.07 | 83.85 | 308.96 | 39.09 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |      |       |       |      |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 50.28 | 31.85 | 0.00 | 55.00 | 31.19 | 23.13 | 55.03 | 48.48 | 0.00 | 51.97 | 34.47 | 0.00 |
| Movement LOS                    | D     | C     |      | E     | C     | C     | E     | D     |      | D     | C     |      |
| d_A, Approach Delay [s/veh]     | 30.69 |       |      | 34.28 |       |       | 31.18 |       |      | 45.04 |       |      |
| Approach LOS                    | C     |       |      | C     |       |       | C     |       |      | D     |       |      |
| d_I, Intersection Delay [s/veh] | 33.77 |       |      |       |       |       |       |       |      |       |       |      |
| Intersection LOS                | C     |       |      |       |       |       |       |       |      |       |       |      |
| Intersection V/C                | 0.623 |       |      |       |       |       |       |       |      |       |       |      |

**Emissions**

|                              |         |         |        |         |       |        |        |         |        |
|------------------------------|---------|---------|--------|---------|-------|--------|--------|---------|--------|
| Vehicle Miles Traveled [mph] | 187.24  | 773.90  | 16.89  | 110.41  | 0.78  | 8.76   | 14.17  | 116.10  | 17.33  |
| Stops [stops/h]              | 400.68  | 1381.36 | 155.72 | 775.17  | 4.37  | 81.55  | 121.97 | 509.44  | 56.86  |
| Fuel consumption [US gal/h]  | 18.39   | 63.81   | 5.39   | 25.27   | 0.14  | 2.31   | 3.42   | 16.19   | 1.88   |
| CO [g/h]                     | 1285.57 | 4460.63 | 377.02 | 1766.37 | 10.14 | 161.52 | 239.23 | 1131.92 | 131.64 |
| NOx [g/h]                    | 250.12  | 867.88  | 73.35  | 343.67  | 1.97  | 31.43  | 46.55  | 220.23  | 25.61  |
| VOC [g/h]                    | 297.94  | 1033.79 | 87.38  | 409.37  | 2.35  | 37.43  | 55.44  | 262.33  | 30.51  |

**Other Modes**

|                                                          |       |  |       |  |       |  |       |  |       |
|----------------------------------------------------------|-------|--|-------|--|-------|--|-------|--|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  |  | 11.0  |  | 11.0  |  | 11.0  |  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  | 0.00  |  | 0.00  |  | 0.00  |  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  | 0.00  |  | 0.00  |  | 0.00  |  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 44.55 |  | 44.55 |  | 44.55 |  | 44.55 |  | 44.55 |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.661 |  | 3.528 |  | 2.880 |  | 2.910 |  |       |
| Crosswalk LOS                                            | D     |  | D     |  | C     |  | C     |  |       |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  | 2000  |  | 2000  |  | 2000  |  |       |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 864   |  | 664   |  | 182   |  | 327   |  |       |
| d_b, Bicycle Delay [s]                                   | 17.76 |  | 24.56 |  | 45.45 |  | 38.47 |  |       |
| I_b,int, Bicycle LOS Score for Intersection              | 2.853 |  | 2.286 |  | 1.752 |  | 2.087 |  |       |
| Bicycle LOS                                              | C     |  | B     |  | A     |  | B     |  |       |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 30.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.558 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 1                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 124         | 449    | 370    | 111         | 364    | 58     | 35             | 44     | 84     | 287            | 58     | 40     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 349    | 0           | 0      | 55     | 0              | 0      | 79     | 0              | 0      | 38     |
| Total Hourly Volume [veh/h]                 | 234         | 846    | 348    | 209         | 686    | 54     | 66             | 83     | 79     | 541            | 109    | 37     |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 62          | 223    | 92     | 55          | 181    | 14     | 17             | 22     | 21     | 142            | 29     | 10     |
| Total Analysis Volume [veh/h]               | 246         | 891    | 366    | 220         | 722    | 57     | 69             | 87     | 83     | 569            | 115    | 39     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 90                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 5       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 3.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 1.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 24   | 38  | 0   | 16   | 30  | 0   | 10   | 16  | 0   | 20   | 26  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 14    | 35    | 35    | 47    | 29    | 29    | 30    | 10    | 10    | 16    | 22    | 22    |
| g / C, Green / Cycle                    | 0.16  | 0.39  | 0.39  | 0.52  | 0.32  | 0.32  | 0.33  | 0.11  | 0.11  | 0.18  | 0.24  | 0.24  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.25  | 0.23  | 0.30  | 0.20  | 0.04  | 0.05  | 0.05  | 0.05  | 0.16  | 0.06  | 0.02  |
| s, saturation flow rate [veh/h]         | 1781  | 3560  | 1589  | 734   | 3560  | 1589  | 1346  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 286   | 1378  | 615   | 411   | 1135  | 507   | 503   | 205   | 174   | 615   | 451   | 383   |
| d1, Uniform Delay [s]                   | 36.80 | 22.55 | 21.97 | 15.60 | 26.19 | 21.66 | 21.03 | 37.42 | 37.64 | 36.41 | 27.62 | 26.57 |
| k, delay calibration                    | 0.16  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.17  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 10.59 | 2.35  | 4.20  | 4.91  | 2.73  | 0.45  | 0.19  | 1.39  | 2.02  | 6.56  | 0.30  | 0.12  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |       |       |       |       |        |       |       |
|---------------------------------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|-------|-------|
| X, volume / capacity                  | 0.86   | 0.65   | 0.59   | 0.53   | 0.64   | 0.11  | 0.14  | 0.42  | 0.48  | 0.93   | 0.26  | 0.10  |
| d, Delay for Lane Group [s/veh]       | 47.39  | 24.91  | 26.17  | 20.52  | 28.92  | 22.11 | 21.22 | 38.81 | 39.66 | 42.98  | 27.91 | 26.69 |
| Lane Group LOS                        | D      | C      | C      | C      | C      | C     | C     | D     | D     | D      | C     | C     |
| Critical Lane Group                   | Yes    | No     | No     | No     | Yes    | No    | No    | No    | Yes   | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 5.69   | 7.16   | 6.08   | 2.54   | 6.31   | 0.83  | 1.00  | 1.83  | 1.77  | 6.50   | 1.98  | 0.65  |
| 50th-Percentile Queue Length [ft/ln]  | 142.17 | 178.92 | 152.10 | 63.52  | 157.86 | 20.79 | 25.07 | 45.67 | 44.36 | 162.52 | 49.50 | 16.15 |
| 95th-Percentile Queue Length [veh/ln] | 9.60   | 11.54  | 10.13  | 4.57   | 10.44  | 1.50  | 1.80  | 3.29  | 3.19  | 10.68  | 3.56  | 1.16  |
| 95th-Percentile Queue Length [ft/ln]  | 239.95 | 288.60 | 253.23 | 114.33 | 260.89 | 37.42 | 45.12 | 82.20 | 79.86 | 267.06 | 89.09 | 29.08 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 47.39 | 24.91 | 26.17 | 20.52 | 28.92 | 22.11 | 21.22 | 38.81 | 39.66 | 42.98 | 27.91 | 26.69 |
| Movement LOS                    | D     | C     | C     | C     | C     | C     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 28.89 |       |       | 26.68 |       |       | 34.03 |       |       | 39.70 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 30.86 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.558 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

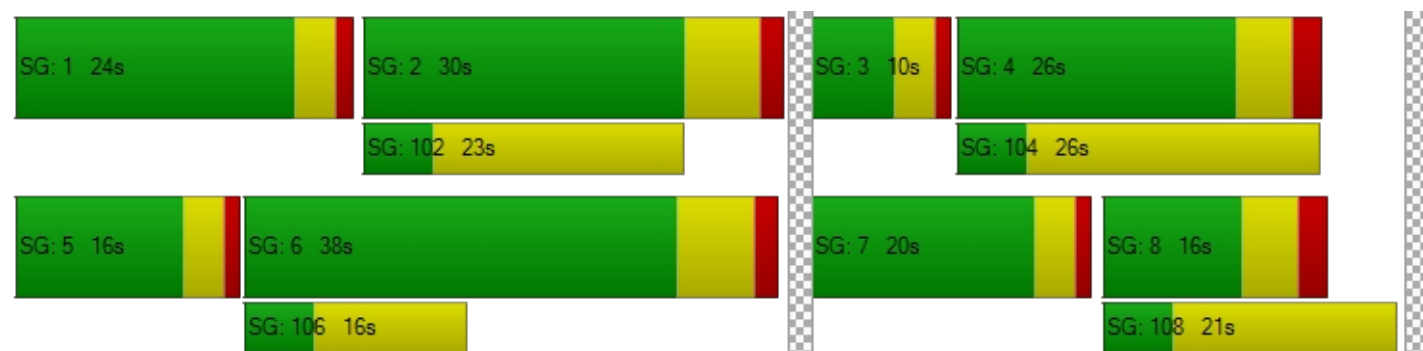
|                              |        |         |        |        |         |       |        |        |        |        |        |       |
|------------------------------|--------|---------|--------|--------|---------|-------|--------|--------|--------|--------|--------|-------|
| Vehicle Miles Traveled [mph] | 80.86  | 292.86  | 120.30 | 54.59  | 179.15  | 14.14 | 22.62  | 28.53  | 27.21  | 86.78  | 17.54  | 5.95  |
| Stops [stops/h]              | 227.48 | 572.54  | 243.37 | 101.63 | 505.16  | 33.26 | 40.10  | 73.07  | 70.98  | 520.07 | 79.19  | 25.85 |
| Fuel consumption [US gal/h]  | 9.30   | 24.95   | 10.49  | 4.63   | 19.62   | 1.35  | 1.46   | 2.32   | 2.24   | 12.20  | 1.92   | 0.63  |
| CO [g/h]                     | 650.22 | 1743.82 | 733.50 | 323.79 | 1371.77 | 94.18 | 102.19 | 162.44 | 156.65 | 852.44 | 134.03 | 44.24 |
| NOx [g/h]                    | 126.51 | 339.28  | 142.71 | 63.00  | 266.90  | 18.32 | 19.88  | 31.61  | 30.48  | 165.85 | 26.08  | 8.61  |
| VOC [g/h]                    | 150.70 | 404.15  | 170.00 | 75.04  | 317.92  | 21.83 | 23.68  | 37.65  | 36.30  | 197.56 | 31.06  | 10.25 |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 36.45 |  |  | 36.45 |  |  | 36.45 |  |  | 36.45 |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.962 |  |  | 3.233 |  |  | 2.470 |  |  | 2.975 |  |  |
| Crosswalk LOS                                            | D     |  |  | C     |  |  | B     |  |  | C     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 689   |  |  | 511   |  |  | 222   |  |  | 444   |  |  |
| d_b, Bicycle Delay [s]                                   | 19.34 |  |  | 24.94 |  |  | 35.56 |  |  | 27.22 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 3.088 |  |  | 2.429 |  |  | 2.084 |  |  | 2.815 |  |  |
| Bicycle LOS                                              | C     |  |  | B     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 13.4  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.014 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 3                | 1      | 142            | 1      | 6              | 168    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850         | 1.8850 | 1.8850         | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0              | 0      | 0              | 0      |
| Diverted Trips [veh/h]                  | 0                | 25     | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 6                | 27     | 268            | 2      | 11             | 317    |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500         | 0.9500 | 0.9500         | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2                | 7      | 71             | 1      | 3              | 83     |
| Total Analysis Volume [veh/h]           | 6                | 28     | 282            | 2      | 12             | 334    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |      |      |      |      |
|---------------------------------------|-------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01  | 0.04 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 13.39 | 9.95 | 0.00 | 0.00 | 7.84 | 0.00 |
| Movement LOS                          | B     | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.04  | 0.12 | 0.00 | 0.00 | 0.03 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 1.05  | 2.88 | 0.00 | 0.00 | 0.71 | 0.00 |
| d_A, Approach Delay [s/veh]           | 10.55 |      | 0.00 |      | 0.27 |      |
| Approach LOS                          | B     |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 0.68  |      |      |      |      |      |
| Intersection LOS                      | B     |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 12.1  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.313 |

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 120    | 0      | 0      | 0                | 0      | 1      | 0            | 151    | 0      | 118          | 236    | 57     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 0.00   | 2.00   | 2.00             | 0.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 219    | 0                | 0      | 0      | 0            | 0      | 209    | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 226    | 0      | 219    | 0                | 0      | 2      | 0            | 285    | 209    | 222          | 445    | 107    |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 59     | 0      | 58     | 0                | 0      | 1      | 0            | 75     | 55     | 58           | 117    | 28     |
| Total Analysis Volume [veh/h]           | 238    | 0      | 231    | 0                | 0      | 2      | 0            | 300    | 220    | 234          | 468    | 113    |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Stop | Stop | Free | Free |
| Flared Lane                        |      |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |       |      |      |      |      |      |      |      |      |      |
|---------------------------------------|-------|------|-------|------|------|------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00  | 0.00 | 0.31  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 0.00  | 0.00 | 12.07 | 0.00 | 0.00 | 9.70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          |       |      | B     |      |      | A    |      | A    | A    |      | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00  | 0.00 | 1.34  | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.00  | 0.00 | 33.42 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 12.07 |      |       | 9.70 |      |      | 0.00 |      |      | 0.00 |      |      |
| Approach LOS                          | B     |      |       | A    |      |      | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 2.11  |      |       |      |      |      |      |      |      |      |      |      |
| Intersection LOS                      | B     |      |       |      |      |      |      |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.6   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.006 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        |                                                                                     |        | Waterbury Dr                                                                        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 30.00                                                                               |        | 30.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        |        |        | Waterbury Dr |        |
|-----------------------------------------|------------------|--------|--------|--------|--------------|--------|
| Base Volume Input [veh/h]               | 15               | 43     | 21     | 0      | 0            | 0      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00   | 2.00   | 2.00         | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850 | 1.8850 | 1.8850       | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0      | 0      | 0            | 0      |
| Site-Generated Trips [veh/h]            | 0                | 0      | 0      | 0      | 0            | 0      |
| Diverted Trips [veh/h]                  | 0                | 0      | 0      | 0      | 5            | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0      | 0      | 0            | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0      | 0      | 0            | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0      | 0      | 0            | 0      |
| Total Hourly Volume [veh/h]             | 28               | 81     | 40     | 0      | 5            | 0      |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500 | 0.9500 | 0.9500       | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 7                | 21     | 11     | 0      | 1            | 0      |
| Total Analysis Volume [veh/h]           | 29               | 85     | 42     | 0      | 5            | 0      |
| Pedestrian Volume [ped/h]               | 0                |        | 0      |        | 0            |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.02 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 7.33 | 0.00 | 0.00 | 0.00 | 9.59 | 8.53 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.05 | 0.05 | 0.00 | 0.00 | 0.02 | 0.02 |
| 95th-Percentile Queue Length [ft/ln]  | 1.23 | 1.23 | 0.00 | 0.00 | 0.48 | 0.48 |
| d_A, Approach Delay [s/veh]           | 1.86 |      | 0.00 |      | 9.59 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.62 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.4   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.008 |

#### Intersection Setup

| Name                         |                                                                                   |        | Liberty Grove Dr                                                                    |        | Salem Ct                                                                            |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Southbound                                                                          |        | Eastbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Thru   | Thru                                                                                | Right  | Left                                                                                | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        | 25.00                                                                               |        | 25.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    |        |        | Liberty Grove Dr |        | Salem Ct |        |
|-----------------------------------------|--------|--------|------------------|--------|----------|--------|
| Base Volume Input [veh/h]               | 9      | 36     | 17               | 2      | 2        | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00             | 2.00   | 2.00     | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850   | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0                | 0      | 0        | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0                | 0      | 0        | 0      |
| Diverted Trips [veh/h]                  | 0      | 5      | 0                | 0      | 3        | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0                | 0      | 0        | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0                | 0      | 0        | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0                | 0      | 0        | 0      |
| Total Hourly Volume [veh/h]             | 17     | 73     | 32               | 4      | 7        | 0      |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500   | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000   | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4      | 19     | 8                | 1      | 2        | 0      |
| Total Analysis Volume [veh/h]           | 18     | 77     | 34               | 4      | 7        | 0      |
| Pedestrian Volume [ped/h]               | 0      |        | 0                |        | 0        |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Free | Free | Stop |
| Flared Lane                        |      |      | No   |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 7.31 | 0.00 | 0.00 | 0.00 | 9.36 | 8.51 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.03 | 0.03 | 0.00 | 0.00 | 0.03 | 0.03 |
| 95th-Percentile Queue Length [ft/ln]  | 0.76 | 0.76 | 0.00 | 0.00 | 0.64 | 0.64 |
| d_A, Approach Delay [s/veh]           | 1.39 |      | 0.00 |      | 9.36 |      |
| Approach LOS                          | A    |      | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.41 |      |      |      |      |      |
| Intersection LOS                      | A    |      |      |      |      |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 328           | 270 | 33            |
| 2    | 318           | 262 | 32            |
| 3    | 312           | 257 | 31            |
| 4    | 292           | 240 | 29            |
| 5    | 259           | 213 | 26            |
| 6    | 256           | 211 | 26            |
| 7    | 253           | 208 | 25            |
| 8    | 230           | 189 | 23            |
| 9    | 226           | 186 | 23            |
| 10   | 223           | 184 | 22            |
| 11   | 194           | 159 | 19            |
| 12   | 180           | 149 | 18            |
| 13   | 177           | 146 | 18            |
| 14   | 131           | 108 | 13            |
| 15   | 131           | 108 | 13            |
| 16   | 92            | 76  | 9             |
| 17   | 52            | 43  | 5             |
| 18   | 52            | 43  | 5             |
| 19   | 30            | 24  | 3             |
| 20   | 16            | 14  | 2             |
| 21   | 10            | 8   | 1             |
| 22   | 3             | 3   | 0             |
| 23   | 3             | 3   | 0             |
| 24   | 3             | 3   | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 598    | 2            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 2             | 580    | 2            | 32     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 2             | 569    | 2            | 31     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 2             | 532    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 2             | 472    | 2            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 2             | 467    | 2            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 2             | 461    | 2            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 419    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 412    | 2            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 407    | 2            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 353    | 2            | 19     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 329    | 2            | 18     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 323    | 2            | 18     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 239    | 2            | 13     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 239    | 2            | 13     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 168    | 2            | 9      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 95     | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 95     | 2            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 54     | 2            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 30     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 18     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 6      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 6      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 6      | 2            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 10.6      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:05      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 33        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 631       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | Yes  |
| #2      | Four Hour Vehicular Volume  | Yes  |
| #3      | Peak Hour                   | Yes  |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S, N |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |   |
|------|---------------|-----|---------------|---|
|      | E             | W   | S             | N |
| 1    | 552           | 494 | 219           | 2 |
| 2    | 535           | 479 | 212           | 2 |
| 3    | 524           | 469 | 208           | 2 |
| 4    | 491           | 440 | 195           | 2 |
| 5    | 436           | 390 | 173           | 2 |
| 6    | 431           | 385 | 171           | 2 |
| 7    | 425           | 380 | 169           | 2 |
| 8    | 386           | 346 | 153           | 1 |
| 9    | 381           | 341 | 151           | 1 |
| 10   | 375           | 336 | 149           | 1 |
| 11   | 326           | 291 | 129           | 1 |
| 12   | 304           | 272 | 120           | 1 |
| 13   | 298           | 267 | 118           | 1 |
| 14   | 221           | 198 | 88            | 1 |
| 15   | 221           | 198 | 88            | 1 |
| 16   | 155           | 138 | 61            | 1 |
| 17   | 88            | 79  | 35            | 0 |
| 18   | 88            | 79  | 35            | 0 |
| 19   | 50            | 44  | 20            | 0 |
| 20   | 28            | 25  | 11            | 0 |
| 21   | 17            | 15  | 7             | 0 |
| 22   | 6             | 5   | 2             | 0 |
| 23   | 6             | 5   | 2             | 0 |
| 24   | 6             | 5   | 2             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 3             | 1046   | 1            | 219    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 2         | 3             | 1014   | 1            | 212    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 3         | 3             | 993    | 1            | 208    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 4         | 3             | 931    | 1            | 195    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 5         | 3             | 826    | 1            | 173    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | Yes         |
| 6         | 3             | 816    | 1            | 171    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | Yes         |
| 7         | 3             | 805    | 1            | 169    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | Yes         |
| 8         | 3             | 732    | 1            | 153    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 9         | 3             | 722    | 1            | 151    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 10        | 3             | 711    | 1            | 149    | No                    | Yes | Yes | Yes | No                    | No  | Yes | Yes | Yes       | No          |
| 11        | 3             | 617    | 1            | 129    | No                    | Yes | Yes | Yes | No                    | No  | No  | Yes | Yes       | No          |
| 12        | 3             | 576    | 1            | 120    | No                    | Yes | Yes | Yes | No                    | No  | No  | Yes | No        | No          |
| 13        | 3             | 565    | 1            | 118    | No                    | No  | Yes | Yes | No                    | No  | No  | Yes | No        | No          |
| 14        | 3             | 419    | 1            | 88     | No                    | No  | No  | Yes | No                    | No  | No  | No  | No        | No          |
| 15        | 3             | 419    | 1            | 88     | No                    | No  | No  | Yes | No                    | No  | No  | No  | No        | No          |
| 16        | 3             | 293    | 1            | 61     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 3             | 167    | 1            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 3             | 167    | 1            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 3             | 94     | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 3             | 53     | 1            | 11     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 3             | 32     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 3             | 11     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 3             | 11     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 3             | 11     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 9                     | 12  | 13  | 15  | 4                     | 9   | 10  | 13  | 11        | 7           |

## Warrant 3 Condition A

| Orientation                                              | S         | N    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 12.1      | 9.7  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:44      | 0:00 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 219       | 2    |
| High Minor Volume Condition Met                          | Yes       | No   |
| Total Entering Volume on All Approaches During Same Hour | 1267      | 1267 |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | Yes       | Yes  |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 109           | 40 | 5             |
| 2    | 106           | 39 | 5             |
| 3    | 104           | 38 | 5             |
| 4    | 97            | 36 | 4             |
| 5    | 86            | 32 | 4             |
| 6    | 85            | 31 | 4             |
| 7    | 84            | 31 | 4             |
| 8    | 76            | 28 | 4             |
| 9    | 75            | 28 | 3             |
| 10   | 74            | 27 | 3             |
| 11   | 64            | 24 | 3             |
| 12   | 60            | 22 | 3             |
| 13   | 59            | 22 | 3             |
| 14   | 44            | 16 | 2             |
| 15   | 44            | 16 | 2             |
| 16   | 31            | 11 | 1             |
| 17   | 17            | 6  | 1             |
| 18   | 17            | 6  | 1             |
| 19   | 10            | 4  | 0             |
| 20   | 5             | 2  | 0             |
| 21   | 3             | 1  | 0             |
| 22   | 1             | 0  | 0             |
| 23   | 1             | 0  | 0             |
| 24   | 1             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 149    | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 145    | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 142    | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 133    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 118    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 116    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 115    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 104    | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 103    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 101    | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 88     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 82     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 81     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 60     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 60     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 42     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 23     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 23     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 14     | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 7      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.6       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:00      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 5         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 154       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | W    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |
|------|---------------|----|---------------|
|      | S             | N  | W             |
| 1    | 90            | 36 | 7             |
| 2    | 87            | 35 | 7             |
| 3    | 86            | 34 | 7             |
| 4    | 80            | 32 | 6             |
| 5    | 71            | 28 | 6             |
| 6    | 70            | 28 | 5             |
| 7    | 69            | 28 | 5             |
| 8    | 63            | 25 | 5             |
| 9    | 62            | 25 | 5             |
| 10   | 61            | 24 | 5             |
| 11   | 53            | 21 | 4             |
| 12   | 50            | 20 | 4             |
| 13   | 49            | 19 | 4             |
| 14   | 36            | 14 | 3             |
| 15   | 36            | 14 | 3             |
| 16   | 25            | 10 | 2             |
| 17   | 14            | 6  | 1             |
| 18   | 14            | 6  | 1             |
| 19   | 8             | 3  | 1             |
| 20   | 5             | 2  | 0             |
| 21   | 3             | 1  | 0             |
| 22   | 1             | 0  | 0             |
| 23   | 1             | 0  | 0             |
| 24   | 1             | 0  | 0             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 126    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 122    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 120    | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 112    | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 99     | 1            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 98     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 97     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 88     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 87     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 85     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 74     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 70     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 68     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 50     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 50     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 35     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 20     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 20     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 11     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 7      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 4      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 1      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | W         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.4       |
| Number of Lanes on Minor Street Approach                 | 1         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:01      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 7         |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 133       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | No        |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

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### Intersection Level Of Service Report

#### Intersection 1: Meridian Road/Stapleton Drive

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 42.8  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.732 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 2                                                                                 | 0      | 1      | 2                                                                                 | 0      | 1      | 2                                                                                   | 0      | 1      | 3                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 534.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 2      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 157         | 346    | 141    | 110         | 980    | 9      | 15           | 75     | 252    | 350          | 145    | 155    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 4           | 0      | 0      | 9           | 11     | 7      | 0            | 0      | 0      | 0            | 3      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 36           | 48     | 56     | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 133    | 0           | 0      | 12     | 0            | 0      | 266    | 0            | 0      | 146    |
| Total Hourly Volume [veh/h]                 | 300         | 652    | 133    | 216         | 1858   | 12     | 64           | 189    | 265    | 660          | 276    | 146    |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 79          | 172    | 35     | 57          | 489    | 3      | 17           | 50     | 70     | 174          | 73     | 38     |
| Total Analysis Volume [veh/h]               | 316         | 686    | 140    | 227         | 1956   | 13     | 67           | 199    | 279    | 695          | 291    | 154    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 130                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Unsigna | Protecte | Permiss | Permiss | Protecte | Permiss | Unsigna | Protecte | Permiss | Unsigna |
|---------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5        | 2       | 0       | 3        | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |          |         |         |          |         |         |          |         |         |
| Maximum Green [s]               | 20       | 70      | 0       | 20       | 70      | 0       | 30       | 40      | 0       | 30       | 40      | 0       |
| Amber [s]                       | 4.0      | 5.5     | 0.0     | 4.0      | 5.5     | 0.0     | 3.0      | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 3.0      | 2.0     | 0.0     | 3.0      | 2.0     | 0.0     | 1.0      | 3.0     | 0.0     | 1.0      | 3.0     | 0.0     |
| Walk [s]                        | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]        | 0        | 29      | 0       | 0        | 29      | 0       | 0        | 15      | 0       | 0        | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0      | 5.5     | 0.0     | 5.0      | 5.5     | 0.0     | 2.0      | 5.0     | 0.0     | 2.0      | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 21   | 44  | 0   | 35   | 58  | 0   | 34   | 20  | 0   | 31   | 17  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 130   | 130   | 130   | 130   | 130   | 130   | 130   | 130   | 130   |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.50  | 7.00  | 7.50  | 7.50  | 4.00  | 7.00  | 4.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.50  | 5.00  | 5.50  | 5.50  | 2.00  | 5.00  | 2.00  | 5.00  |
| g_i, Effective Green Time [s]           | 14    | 57    | 11    | 54    | 54    | 5     | 10    | 27    | 32    |
| g / C, Green / Cycle                    | 0.11  | 0.44  | 0.08  | 0.41  | 0.41  | 0.04  | 0.08  | 0.21  | 0.25  |
| (v / s)_i Volume / Saturation Flow Rate | 0.09  | 0.13  | 0.07  | 0.38  | 0.01  | 0.02  | 0.06  | 0.20  | 0.08  |
| s, saturation flow rate [veh/h]         | 3459  | 5094  | 3459  | 5094  | 1589  | 3459  | 3560  | 3459  | 3560  |
| c, Capacity [veh/h]                     | 365   | 2214  | 292   | 2106  | 657   | 126   | 274   | 718   | 884   |
| d1, Uniform Delay [s]                   | 57.23 | 24.01 | 58.31 | 36.29 | 22.54 | 61.52 | 58.65 | 51.07 | 40.01 |
| k, delay calibration                    | 0.11  | 0.50  | 0.11  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 6.21  | 0.36  | 4.45  | 8.74  | 0.06  | 3.41  | 3.64  | 9.70  | 0.22  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |       |        |        |        |
|---------------------------------------|--------|--------|--------|--------|-------|-------|--------|--------|--------|
| X, volume / capacity                  | 0.87   | 0.31   | 0.78   | 0.93   | 0.02  | 0.53  | 0.73   | 0.97   | 0.33   |
| d, Delay for Lane Group [s/veh]       | 63.43  | 24.37  | 62.76  | 45.03  | 22.60 | 64.93 | 62.29  | 60.76  | 40.23  |
| Lane Group LOS                        | E      | C      | E      | D      | C     | E     | E      | E      | D      |
| Critical Lane Group                   | Yes    | No     | No     | Yes    | No    | No    | Yes    | Yes    | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.23   | 4.40   | 3.71   | 19.86  | 0.23  | 1.13  | 3.28   | 11.86  | 3.76   |
| 50th-Percentile Queue Length [ft/ln]  | 130.80 | 110.07 | 92.74  | 496.51 | 5.87  | 28.19 | 81.90  | 296.50 | 93.99  |
| 95th-Percentile Queue Length [veh/ln] | 8.98   | 7.84   | 6.68   | 27.17  | 0.42  | 2.03  | 5.90   | 17.51  | 6.77   |
| 95th-Percentile Queue Length [ft/ln]  | 224.58 | 196.10 | 166.93 | 679.23 | 10.57 | 50.74 | 147.41 | 437.69 | 169.18 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |      |       |       |      |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 63.43 | 24.37 | 0.00 | 62.76 | 45.03 | 22.60 | 64.93 | 62.29 | 0.00 | 60.76 | 40.23 | 0.00 |
| Movement LOS                    | E     | C     |      | E     | D     | C     | E     | E     |      | E     | D     |      |
| d_A, Approach Delay [s/veh]     | 32.39 |       |      | 46.73 |       |       | 31.54 |       |      | 47.65 |       |      |
| Approach LOS                    | C     |       |      | D     |       |       | C     |       |      | D     |       |      |
| d_I, Intersection Delay [s/veh] | 42.80 |       |      |       |       |       |       |       |      |       |       |      |
| Intersection LOS                | D     |       |      |       |       |       |       |       |      |       |       |      |
| Intersection V/C                | 0.732 |       |      |       |       |       |       |       |      |       |       |      |

**Emissions**

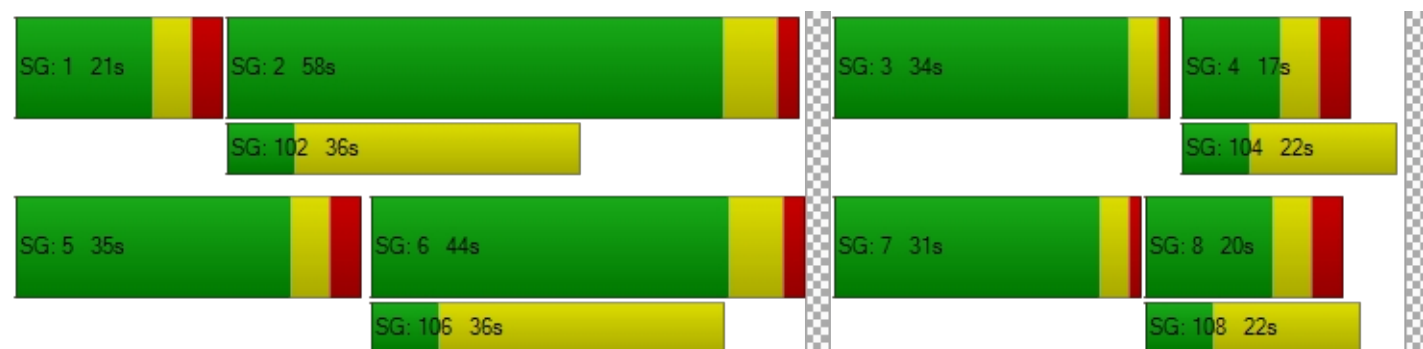
|                              |        |         |        |         |       |        |        |         |        |
|------------------------------|--------|---------|--------|---------|-------|--------|--------|---------|--------|
| Vehicle Miles Traveled [mph] | 129.19 | 280.45  | 22.16  | 190.94  | 1.27  | 6.59   | 19.58  | 145.12  | 60.76  |
| Stops [stops/h]              | 289.77 | 365.78  | 205.46 | 1649.96 | 6.51  | 62.45  | 181.43 | 656.85  | 208.22 |
| Fuel consumption [US gal/h]  | 13.78  | 19.58   | 7.46   | 54.96   | 0.22  | 1.89   | 5.45   | 21.73   | 7.05   |
| CO [g/h]                     | 963.40 | 1368.50 | 521.21 | 3841.53 | 15.59 | 131.94 | 380.88 | 1519.23 | 493.06 |
| NOx [g/h]                    | 187.44 | 266.26  | 101.41 | 747.42  | 3.03  | 25.67  | 74.11  | 295.59  | 95.93  |
| VOC [g/h]                    | 223.28 | 317.16  | 120.79 | 890.31  | 3.61  | 30.58  | 88.27  | 352.10  | 114.27 |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  | 11.0  | 11.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 54.47 | 54.47 | 54.47 | 54.47 |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.637 | 3.530 | 2.907 | 3.001 |
| Crosswalk LOS                                            | D     | D     | C     | C     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 562   | 777   | 200   | 154   |
| d_b, Bicycle Delay [s]                                   | 33.62 | 24.31 | 52.65 | 55.38 |
| I_b,int, Bicycle LOS Score for Intersection              | 2.111 | 2.774 | 1.779 | 2.373 |
| Bicycle LOS                                              | B     | C     | A     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 42.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | D     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.739 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 98          | 328    | 109    | 70          | 411    | 57     | 102            | 131    | 263    | 397            | 176    | 169    |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 5      | 5      | 29             | 9      | 20     | 2              | 2      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 103    | 0           | 0      | 56     | 0              | 0      | 258    | 0              | 0      | 160    |
| Total Hourly Volume [veh/h]                 | 185         | 618    | 102    | 132         | 780    | 56     | 221            | 256    | 258    | 750            | 334    | 159    |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 49          | 163    | 27     | 35          | 205    | 15     | 58             | 67     | 68     | 197            | 88     | 42     |
| Total Analysis Volume [veh/h]               | 195         | 651    | 107    | 139         | 821    | 59     | 233            | 269    | 272    | 789            | 352    | 167    |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 110                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 5       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 3.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 1.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 24   | 44  | 0   | 10   | 30  | 0   | 13   | 26  | 0   | 30   | 43  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 14    | 37    | 37    | 47    | 29    | 29    | 50    | 20    | 20    | 26    | 37    | 37    |
| g / C, Green / Cycle                    | 0.13  | 0.34  | 0.34  | 0.43  | 0.26  | 0.26  | 0.45  | 0.18  | 0.18  | 0.24  | 0.34  | 0.34  |
| (v / s)_i Volume / Saturation Flow Rate | 0.11  | 0.18  | 0.07  | 0.16  | 0.23  | 0.04  | 0.22  | 0.14  | 0.17  | 0.23  | 0.19  | 0.11  |
| s, saturation flow rate [veh/h]         | 1781  | 3560  | 1589  | 890   | 3560  | 1589  | 1080  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 228   | 1198  | 535   | 373   | 936   | 418   | 453   | 340   | 289   | 817   | 629   | 535   |
| d1, Uniform Delay [s]                   | 46.97 | 29.64 | 25.97 | 21.08 | 38.83 | 31.03 | 20.60 | 43.00 | 44.42 | 41.55 | 29.84 | 27.07 |
| k, delay calibration                    | 0.15  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 11.54 | 1.77  | 0.84  | 2.84  | 11.37 | 0.71  | 4.13  | 4.15  | 14.06 | 8.53  | 0.78  | 0.33  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |       |        |        |       |        |        |        |        |        |        |
|---------------------------------------|--------|--------|-------|--------|--------|-------|--------|--------|--------|--------|--------|--------|
| X, volume / capacity                  | 0.86   | 0.54   | 0.20  | 0.37   | 0.88   | 0.14  | 0.51   | 0.79   | 0.94   | 0.97   | 0.56   | 0.31   |
| d, Delay for Lane Group [s/veh]       | 58.51  | 31.42  | 26.81 | 23.91  | 50.21  | 31.74 | 24.73  | 47.16  | 58.48  | 50.09  | 30.62  | 27.40  |
| Lane Group LOS                        | E      | C      | C     | C      | D      | C     | C      | D      | E      | D      | C      | C      |
| Critical Lane Group                   | Yes    | No     | No    | No     | Yes    | No    | No     | No     | Yes    | Yes    | No     | No     |
| 50th-Percentile Queue Length [veh/ln] | 5.69   | 6.77   | 1.99  | 2.33   | 11.34  | 1.21  | 4.15   | 7.27   | 8.31   | 11.30  | 7.58   | 3.25   |
| 50th-Percentile Queue Length [ft/ln]  | 142.21 | 169.27 | 49.75 | 58.15  | 283.52 | 30.37 | 103.84 | 181.74 | 207.80 | 282.62 | 189.52 | 81.31  |
| 95th-Percentile Queue Length [veh/ln] | 9.60   | 11.04  | 3.58  | 4.19   | 16.86  | 2.19  | 7.48   | 11.69  | 13.04  | 16.82  | 12.10  | 5.85   |
| 95th-Percentile Queue Length [ft/ln]  | 239.99 | 275.96 | 89.54 | 104.68 | 421.59 | 54.66 | 186.92 | 292.28 | 326.01 | 420.47 | 302.41 | 146.36 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 58.51 | 31.42 | 26.81 | 23.91 | 50.21 | 31.74 | 24.73 | 47.16 | 58.48 | 50.09 | 30.62 | 27.40 |
| Movement LOS                    | E     | C     | C     | C     | D     | C     | C     | D     | E     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 36.44 |       |       | 45.55 |       |       | 44.38 |       |       | 41.95 |       |       |
| Approach LOS                    | D     |       |       | D     |       |       | D     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 42.03 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | D     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.739 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

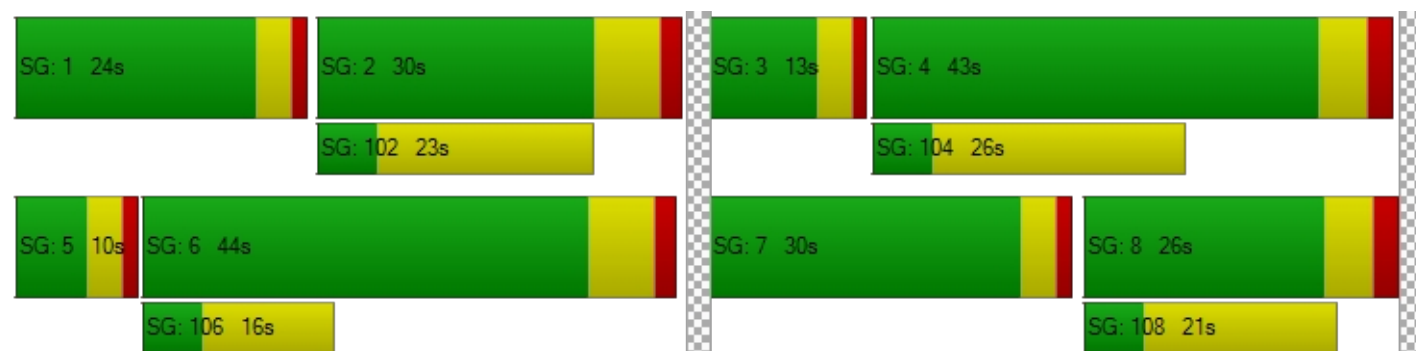
|                              |        |         |        |        |         |        |        |        |        |         |        |        |
|------------------------------|--------|---------|--------|--------|---------|--------|--------|--------|--------|---------|--------|--------|
| Vehicle Miles Traveled [mph] | 64.09  | 213.98  | 35.17  | 34.49  | 203.72  | 14.64  | 76.40  | 88.20  | 89.18  | 120.33  | 53.68  | 25.47  |
| Stops [stops/h]              | 186.16 | 443.19  | 65.12  | 76.13  | 742.31  | 39.75  | 135.94 | 237.91 | 272.03 | 739.94  | 248.10 | 106.45 |
| Fuel consumption [US gal/h]  | 7.92   | 19.55   | 2.97   | 3.24   | 28.99   | 1.61   | 5.11   | 7.73   | 8.68   | 18.19   | 6.11   | 2.70   |
| CO [g/h]                     | 553.85 | 1366.67 | 207.60 | 226.77 | 2026.41 | 112.48 | 356.96 | 540.49 | 606.87 | 1271.67 | 426.78 | 188.90 |
| NOx [g/h]                    | 107.76 | 265.90  | 40.39  | 44.12  | 394.26  | 21.88  | 69.45  | 105.16 | 118.08 | 247.42  | 83.04  | 36.75  |
| VOC [g/h]                    | 128.36 | 316.74  | 48.11  | 52.56  | 469.64  | 26.07  | 82.73  | 125.26 | 140.65 | 294.72  | 98.91  | 43.78  |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 46.37 |  |  | 46.37 |  |  | 46.37 |  |  | 46.37 |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.568 |  |  | 3.386 |  |  | 2.991 |  |  | 3.157 |  |  |
| Crosswalk LOS                                            | D     |  |  | C     |  |  | C     |  |  | C     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 673   |  |  | 418   |  |  | 364   |  |  | 673   |  |  |
| d_b, Bicycle Delay [s]                                   | 24.22 |  |  | 34.40 |  |  | 36.82 |  |  | 24.22 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 2.431 |  |  | 2.446 |  |  | 3.262 |  |  | 3.982 |  |  |
| Bicycle LOS                                              | B     |  |  | B     |  |  | C     |  |  | D     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 42.8  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | E     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.144 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 7                | 6      | 489            | 15     | 4              | 300    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850         | 1.8850 | 1.8850         | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 2                | 58     | 0              | 9      | 7              | 0      |
| Diverted Trips [veh/h]                  | 0                | 35     | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 15               | 104    | 922            | 37     | 15             | 566    |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500         | 0.9500 | 0.9500         | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4                | 27     | 243            | 10     | 4              | 149    |
| Total Analysis Volume [veh/h]           | 16               | 109    | 971            | 39     | 16             | 596    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |       |      |
|---------------------------------------|-------|-------|------|------|-------|------|
| V/C, Movement V/C Ratio               | 0.14  | 0.36  | 0.01 | 0.00 | 0.02  | 0.01 |
| d_M, Delay for Movement [s/veh]       | 42.82 | 23.80 | 0.00 | 0.00 | 10.37 | 0.00 |
| Movement LOS                          | E     | C     | A    | A    | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.49  | 1.61  | 0.00 | 0.00 | 0.07  | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 12.14 | 40.32 | 0.00 | 0.00 | 1.79  | 0.00 |
| d_A, Approach Delay [s/veh]           | 26.24 |       | 0.00 |      | 0.27  |      |
| Approach LOS                          | D     |       | A    |      | A     |      |
| d_I, Intersection Delay [s/veh]       | 1.97  |       |      |      |       |      |
| Intersection LOS                      | E     |       |      |      |       |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 12.7  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.273 |

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 124    | 0      | 0      | 0                | 0      | 17     | 0            | 293    | 0      | 59           | 294    | 13     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 0.00   | 2.00   | 2.00             | 0.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0                | 0      | 26     | 0            | 0      | 0      | 0            | 0      | 14     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 166    | 0                | 0      | 0      | 0            | 0      | 125    | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 234    | 0      | 166    | 0                | 0      | 58     | 0            | 552    | 125    | 111          | 554    | 39     |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 62     | 0      | 44     | 0                | 0      | 15     | 0            | 145    | 33     | 29           | 146    | 10     |
| Total Analysis Volume [veh/h]           | 246    | 0      | 175    | 0                | 0      | 61     | 0            | 581    | 132    | 117          | 583    | 41     |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Stop | Stop | Free | Free |
| Flared Lane                        |      |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |       |       |      |       |      |      |      |      |      |      |
|---------------------------------------|-------|------|-------|-------|------|-------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00  | 0.00 | 0.27  | 0.00  | 0.00 | 0.09  | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 0.00  | 0.00 | 12.73 | 0.00  | 0.00 | 10.59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          |       |      | B     |       |      | B     |      | A    | A    |      | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00  | 0.00 | 1.11  | 0.00  | 0.00 | 0.28  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.00  | 0.00 | 27.70 | 0.00  | 0.00 | 7.08  | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 12.73 |      |       | 10.59 |      |       | 0.00 |      |      | 0.00 |      |      |
| Approach LOS                          | B     |      |       | B     |      |       | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 1.83  |      |       |       |      |       |      |      |      |      |      |      |
| Intersection LOS                      | B     |      |       |       |      |       |      |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 10.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.010 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        |        |                                                                                   |        |        | Waterbury Dr                                                                        |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        |        |        |        |        | Waterbury Dr |        |        |        |        |        |
|-----------------------------------------|------------------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 7                | 13     | 0      | 0      | 41     | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                | 7      | 7      | 8      | 13     | 0      | 0            | 0      | 0      | 13     | 0      | 30     |
| Diverted Trips [veh/h]                  | 0                | 0      | 0      | 0      | 0      | 0      | 7            | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 13               | 32     | 7      | 8      | 90     | 0      | 7            | 0      | 0      | 13     | 0      | 30     |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 3                | 8      | 2      | 2      | 24     | 0      | 2            | 0      | 0      | 3      | 0      | 8      |
| Total Analysis Volume [veh/h]           | 14               | 34     | 7      | 8      | 95     | 0      | 7            | 0      | 0      | 14     | 0      | 32     |
| Pedestrian Volume [ped/h]               | 0                |        |        | 0      |        |        | 0            |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |      |       |      |      |       |      |
|---------------------------------------|------|------|------|------|------|------|------|-------|------|------|-------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00  | 0.00 | 0.02 | 0.00  | 0.03 |
| d_M, Delay for Movement [s/veh]       | 7.42 | 0.00 | 0.00 | 7.30 | 0.00 | 0.00 | 9.96 | 10.17 | 8.79 | 9.85 | 10.29 | 8.68 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | A    | B     | A    | A    | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.03 | 0.03  | 0.03 | 0.15 | 0.15  | 0.15 |
| 95th-Percentile Queue Length [ft/ln]  | 0.61 | 0.61 | 0.61 | 0.33 | 0.33 | 0.33 | 0.72 | 0.72  | 0.72 | 3.86 | 3.86  | 3.86 |
| d_A, Approach Delay [s/veh]           | 1.89 |      |      | 0.57 |      |      | 9.96 |       |      | 9.03 |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | A    |       |      | A    |       |      |
| d_I, Intersection Delay [s/veh]       | 3.07 |      |      |      |      |      |      |       |      |      |       |      |
| Intersection LOS                      | A    |      |      |      |      |      |      |       |      |      |       |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 9.9   |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | A     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.011 |

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Salem Ct                                                                            |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 25.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Salem Ct |        |        |        |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 3      | 10     | 0      | 0                | 34     | 1      | 1        | 0      | 0      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00             | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850 | 1.8850   | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 30     | 7      | 8                | 8      | 0      | 0        | 0      | 0      | 13     | 0      | 30     |
| Diverted Trips [veh/h]                  | 0      | 7      | 0      | 0                | 0      | 0      | 6        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 6      | 56     | 7      | 8                | 72     | 2      | 8        | 0      | 0      | 13     | 0      | 30     |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500 | 0.9500   | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2      | 15     | 2      | 2                | 19     | 1      | 2        | 0      | 0      | 3      | 0      | 8      |
| Total Analysis Volume [veh/h]           | 6      | 59     | 7      | 8                | 76     | 2      | 8        | 0      | 0      | 14     | 0      | 32     |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0        |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |      |       |      |      |       |      |
|---------------------------------------|------|------|------|------|------|------|------|-------|------|------|-------|------|
| V/C, Movement V/C Ratio               | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00  | 0.00 | 0.02 | 0.00  | 0.03 |
| d_M, Delay for Movement [s/veh]       | 7.37 | 0.00 | 0.00 | 7.35 | 0.00 | 0.00 | 9.88 | 10.09 | 8.71 | 9.77 | 10.22 | 8.80 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | A    | B     | A    | A    | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.03 | 0.03  | 0.03 | 0.16 | 0.16  | 0.16 |
| 95th-Percentile Queue Length [ft/ln]  | 0.26 | 0.26 | 0.26 | 0.34 | 0.34 | 0.34 | 0.81 | 0.81  | 0.81 | 3.91 | 3.91  | 3.91 |
| d_A, Approach Delay [s/veh]           | 0.61 |      |      | 0.68 |      |      | 9.88 |       |      | 9.09 |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | A    |       |      | A    |       |      |
| d_I, Intersection Delay [s/veh]       | 2.83 |      |      |      |      |      |      |       |      |      |       |      |
| Intersection LOS                      | A    |      |      |      |      |      |      |       |      |      |       |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 581           | 959 | 119           |
| 2    | 564           | 930 | 115           |
| 3    | 552           | 911 | 113           |
| 4    | 517           | 854 | 106           |
| 5    | 459           | 758 | 94            |
| 6    | 453           | 748 | 93            |
| 7    | 447           | 738 | 92            |
| 8    | 407           | 671 | 83            |
| 9    | 401           | 662 | 82            |
| 10   | 395           | 652 | 81            |
| 11   | 343           | 566 | 70            |
| 12   | 320           | 527 | 65            |
| 13   | 314           | 518 | 64            |
| 14   | 232           | 384 | 48            |
| 15   | 232           | 384 | 48            |
| 16   | 163           | 269 | 33            |
| 17   | 93            | 153 | 19            |
| 18   | 93            | 153 | 19            |
| 19   | 52            | 86  | 11            |
| 20   | 29            | 48  | 6             |
| 21   | 17            | 29  | 4             |
| 22   | 6             | 10  | 1             |
| 23   | 6             | 10  | 1             |
| 24   | 6             | 10  | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 1540   | 2            | 119    | No                    | No  | No  | Yes | Yes                   | Yes | Yes | Yes | Yes       | No          |
| 2         | 2             | 1494   | 2            | 115    | No                    | No  | No  | Yes | Yes                   | Yes | Yes | Yes | No        | No          |
| 3         | 2             | 1463   | 2            | 113    | No                    | No  | No  | Yes | Yes                   | Yes | Yes | Yes | No        | No          |
| 4         | 2             | 1371   | 2            | 106    | No                    | No  | No  | No  | Yes                   | Yes | Yes | Yes | No        | No          |
| 5         | 2             | 1217   | 2            | 94     | No                    | No  | No  | No  | No                    | Yes | Yes | Yes | No        | No          |
| 6         | 2             | 1201   | 2            | 93     | No                    | No  | No  | No  | No                    | Yes | Yes | Yes | No        | No          |
| 7         | 2             | 1185   | 2            | 92     | No                    | No  | No  | No  | No                    | Yes | Yes | Yes | No        | No          |
| 8         | 2             | 1078   | 2            | 83     | No                    | No  | No  | No  | No                    | Yes | Yes | Yes | No        | No          |
| 9         | 2             | 1063   | 2            | 82     | No                    | No  | No  | No  | No                    | Yes | Yes | Yes | No        | No          |
| 10        | 2             | 1047   | 2            | 81     | No                    | No  | No  | No  | No                    | Yes | Yes | Yes | No        | No          |
| 11        | 2             | 909    | 2            | 70     | No                    | No  | No  | No  | No                    | No  | Yes | Yes | No        | No          |
| 12        | 2             | 847    | 2            | 65     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 13        | 2             | 832    | 2            | 64     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 14        | 2             | 616    | 2            | 48     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 616    | 2            | 48     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 432    | 2            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 246    | 2            | 19     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 246    | 2            | 19     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 138    | 2            | 11     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 77     | 2            | 6      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 46     | 2            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 16     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 16     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 16     | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 3   | 4                     | 10  | 11  | 13  | 1         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 26.2      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:52      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 119       |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 1659      |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | Yes  |
| #2      | Four Hour Vehicular Volume  | Yes  |
| #3      | Peak Hour                   | Yes  |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S, N |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |    |
|------|---------------|-----|---------------|----|
|      | E             | W   | S             | N  |
| 1    | 593           | 677 | 166           | 58 |
| 2    | 575           | 657 | 161           | 56 |
| 3    | 563           | 643 | 158           | 55 |
| 4    | 528           | 603 | 148           | 52 |
| 5    | 468           | 535 | 131           | 46 |
| 6    | 463           | 528 | 129           | 45 |
| 7    | 457           | 521 | 128           | 45 |
| 8    | 415           | 474 | 116           | 41 |
| 9    | 409           | 467 | 115           | 40 |
| 10   | 403           | 460 | 113           | 39 |
| 11   | 350           | 399 | 98            | 34 |
| 12   | 326           | 372 | 91            | 32 |
| 13   | 320           | 366 | 90            | 31 |
| 14   | 237           | 271 | 66            | 23 |
| 15   | 237           | 271 | 66            | 23 |
| 16   | 166           | 190 | 46            | 16 |
| 17   | 95            | 108 | 27            | 9  |
| 18   | 95            | 108 | 27            | 9  |
| 19   | 53            | 61  | 15            | 5  |
| 20   | 30            | 34  | 8             | 3  |
| 21   | 18            | 20  | 5             | 2  |
| 22   | 6             | 7   | 2             | 1  |
| 23   | 6             | 7   | 2             | 1  |
| 24   | 6             | 7   | 2             | 1  |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 3             | 1270   | 1            | 166    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 2         | 3             | 1232   | 1            | 161    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 3         | 3             | 1206   | 1            | 158    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 4         | 3             | 1131   | 1            | 148    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 5         | 3             | 1003   | 1            | 131    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 6         | 3             | 991    | 1            | 129    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 7         | 3             | 978    | 1            | 128    | No                    | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 8         | 3             | 889    | 1            | 116    | No                    | No  | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 9         | 3             | 876    | 1            | 115    | No                    | No  | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 10        | 3             | 863    | 1            | 113    | No                    | No  | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 11        | 3             | 749    | 1            | 98     | No                    | No  | No  | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 12        | 3             | 698    | 1            | 91     | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 13        | 3             | 686    | 1            | 90     | No                    | No  | No  | Yes | No                    | No  | Yes | Yes | No        | No          |
| 14        | 3             | 508    | 1            | 66     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 15        | 3             | 508    | 1            | 66     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 16        | 3             | 356    | 1            | 46     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 3             | 203    | 1            | 27     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 3             | 203    | 1            | 27     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 3             | 114    | 1            | 15     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 3             | 64     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 3             | 38     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 3             | 13     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 3             | 13     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 3             | 13     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 3                     | 7   | 10  | 13  | 7                     | 11  | 13  | 15  | 11        | 7           |

## Warrant 3 Condition A

| Orientation                                              | S         | N    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 12.7      | 10.6 |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:35      | 0:10 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 166       | 58   |
| High Minor Volume Condition Met                          | Yes       | No   |
| Total Entering Volume on All Approaches During Same Hour | 1494      | 1494 |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | Yes       | Yes  |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 52            | 98 | 43            | 7 |
| 2    | 50            | 95 | 42            | 7 |
| 3    | 49            | 93 | 41            | 7 |
| 4    | 46            | 87 | 38            | 6 |
| 5    | 41            | 77 | 34            | 6 |
| 6    | 41            | 76 | 34            | 5 |
| 7    | 40            | 75 | 33            | 5 |
| 8    | 36            | 69 | 30            | 5 |
| 9    | 36            | 68 | 30            | 5 |
| 10   | 35            | 67 | 29            | 5 |
| 11   | 31            | 58 | 25            | 4 |
| 12   | 29            | 54 | 24            | 4 |
| 13   | 28            | 53 | 23            | 4 |
| 14   | 21            | 39 | 17            | 3 |
| 15   | 21            | 39 | 17            | 3 |
| 16   | 15            | 27 | 12            | 2 |
| 17   | 8             | 16 | 7             | 1 |
| 18   | 8             | 16 | 7             | 1 |
| 19   | 5             | 9  | 4             | 1 |
| 20   | 3             | 5  | 2             | 0 |
| 21   | 2             | 3  | 1             | 0 |
| 22   | 1             | 1  | 0             | 0 |
| 23   | 1             | 1  | 0             | 0 |
| 24   | 1             | 1  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 150    | 1            | 43     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 145    | 1            | 42     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 142    | 1            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 133    | 1            | 38     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 118    | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 117    | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 115    | 1            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 105    | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 104    | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 102    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 89     | 1            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 83     | 1            | 24     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 81     | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 60     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 60     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 42     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 24     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 24     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 14     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 8      | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 5      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9         | 10   |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:06      | 0:01 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 43        | 7    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 200       | 200  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 69            | 82 | 43            | 8 |
| 2    | 67            | 80 | 42            | 8 |
| 3    | 66            | 78 | 41            | 8 |
| 4    | 61            | 73 | 38            | 7 |
| 5    | 55            | 65 | 34            | 6 |
| 6    | 54            | 64 | 34            | 6 |
| 7    | 53            | 63 | 33            | 6 |
| 8    | 48            | 57 | 30            | 6 |
| 9    | 48            | 57 | 30            | 6 |
| 10   | 47            | 56 | 29            | 5 |
| 11   | 41            | 48 | 25            | 5 |
| 12   | 38            | 45 | 24            | 4 |
| 13   | 37            | 44 | 23            | 4 |
| 14   | 28            | 33 | 17            | 3 |
| 15   | 28            | 33 | 17            | 3 |
| 16   | 19            | 23 | 12            | 2 |
| 17   | 11            | 13 | 7             | 1 |
| 18   | 11            | 13 | 7             | 1 |
| 19   | 6             | 7  | 4             | 1 |
| 20   | 3             | 4  | 2             | 0 |
| 21   | 2             | 2  | 1             | 0 |
| 22   | 1             | 1  | 0             | 0 |
| 23   | 1             | 1  | 0             | 0 |
| 24   | 1             | 1  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 151    | 1            | 43     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 147    | 1            | 42     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 144    | 1            | 41     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 134    | 1            | 38     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 120    | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 118    | 1            | 34     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 116    | 1            | 33     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 105    | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 105    | 1            | 30     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 103    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 89     | 1            | 25     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 83     | 1            | 24     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 81     | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 61     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 61     | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 42     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 24     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 24     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 13     | 1            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 7      | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 4      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.1       | 9.9  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:06      | 0:01 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 43        | 8    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 202       | 202  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

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### Intersection Level Of Service Report

#### Intersection 1: Meridian Road/Stapleton Drive

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 34.0  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.625 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 3                                                                                 | 0      | 1      | 2                                                                                 | 0      | 1      | 2                                                                                   | 0      | 1      | 3                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 710.00                                                                            | 100.00 | 600.00 | 315.00                                                                            | 100.00 | 280.00 | 160.00                                                                              | 100.00 | 185.00 | 534.00                                                                              | 100.00 | 275.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 1      | 0                                                                                   | 0      | 2      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 | 0.00                                                                                | 0.00   | 100.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]                   | 231         | 954    | 386    | 87          | 570    | 9      | 10           | 35     | 131    | 280          | 42     | 70     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |              |        |        |              |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]                | 12          | 0      | 0      | 6           | 7      | 22     | 0            | 0      | 0      | 0            | 10     | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 66           | 71     | 49     | 0            | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 364    | 0           | 0      | 20     | 0            | 0      | 148    | 0            | 0      | 66     |
| Total Hourly Volume [veh/h]                 | 447         | 1798   | 364    | 170         | 1081   | 19     | 85           | 137    | 148    | 528          | 89     | 66     |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 118         | 473    | 96     | 45          | 284    | 5      | 22           | 36     | 39     | 139          | 23     | 17     |
| Total Analysis Volume [veh/h]               | 471         | 1893   | 383    | 179         | 1138   | 20     | 89           | 144    | 156    | 556          | 94     | 69     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No           |        | No     | No           |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 110                                   |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Unsigna | Protecte | Permiss | Permiss | Protecte | Permiss | Unsigna | Protecte | Permiss | Unsigna |
|---------------------------------|----------|---------|---------|----------|---------|---------|----------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5        | 2       | 0       | 3        | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |          |         |         |          |         |         |          |         |         |
| Maximum Green [s]               | 20       | 70      | 0       | 20       | 70      | 0       | 30       | 40      | 0       | 30       | 40      | 0       |
| Amber [s]                       | 4.0      | 5.5     | 0.0     | 4.0      | 5.5     | 0.0     | 3.0      | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 3.0      | 2.0     | 0.0     | 3.0      | 2.0     | 0.0     | 1.0      | 3.0     | 0.0     | 1.0      | 3.0     | 0.0     |
| Walk [s]                        | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       | 0        | 7       | 0       |
| Pedestrian Clearance [s]        | 0        | 29      | 0       | 0        | 29      | 0       | 0        | 15      | 0       | 0        | 15      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |          | No      |         |          | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 5.0      | 5.5     | 0.0     | 5.0      | 5.5     | 0.0     | 2.0      | 5.0     | 0.0     | 2.0      | 5.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 26   | 55  | 0   | 15   | 44  | 0   | 15   | 17  | 0   | 23   | 25  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | L     | C     | R     | L     | C     | L     | C     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   | 110   |
| L, Total Lost Time per Cycle [s]        | 7.00  | 7.50  | 7.00  | 7.50  | 7.50  | 4.00  | 7.00  | 4.00  | 7.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 5.00  | 5.50  | 5.00  | 5.50  | 5.50  | 2.00  | 5.00  | 2.00  | 5.00  |
| g_i, Effective Green Time [s]           | 17    | 48    | 8     | 39    | 39    | 5     | 10    | 19    | 24    |
| g / C, Green / Cycle                    | 0.16  | 0.44  | 0.07  | 0.35  | 0.35  | 0.04  | 0.09  | 0.17  | 0.22  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.37  | 0.05  | 0.22  | 0.01  | 0.03  | 0.04  | 0.16  | 0.03  |
| s, saturation flow rate [veh/h]         | 3459  | 5094  | 3459  | 5094  | 1589  | 3459  | 3560  | 3459  | 3560  |
| c, Capacity [veh/h]                     | 537   | 2224  | 239   | 1785  | 557   | 153   | 320   | 597   | 777   |
| d1, Uniform Delay [s]                   | 45.45 | 27.78 | 50.28 | 29.88 | 23.50 | 51.57 | 47.48 | 44.85 | 34.52 |
| k, delay calibration                    | 0.11  | 0.50  | 0.11  | 0.50  | 0.50  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 4.79  | 4.34  | 4.70  | 1.75  | 0.12  | 3.47  | 0.99  | 7.12  | 0.07  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |       |       |       |        |       |
|---------------------------------------|--------|--------|--------|--------|-------|-------|-------|--------|-------|
| X, volume / capacity                  | 0.88   | 0.85   | 0.75   | 0.64   | 0.04  | 0.58  | 0.45  | 0.93   | 0.12  |
| d, Delay for Lane Group [s/veh]       | 50.23  | 32.12  | 54.98  | 31.63  | 23.62 | 55.03 | 48.48 | 51.97  | 34.59 |
| Lane Group LOS                        | D      | C      | D      | C      | C     | E     | D     | D      | C     |
| Critical Lane Group                   | No     | Yes    | Yes    | No     | No    | No    | Yes   | Yes    | No    |
| 50th-Percentile Queue Length [veh/ln] | 6.30   | 14.14  | 2.46   | 8.02   | 0.34  | 1.25  | 1.86  | 7.78   | 0.99  |
| 50th-Percentile Queue Length [ft/ln]  | 157.49 | 353.51 | 61.54  | 200.44 | 8.48  | 31.15 | 46.58 | 194.58 | 24.68 |
| 95th-Percentile Queue Length [veh/ln] | 10.42  | 20.31  | 4.43   | 12.66  | 0.61  | 2.24  | 3.35  | 12.36  | 1.78  |
| 95th-Percentile Queue Length [ft/ln]  | 260.40 | 507.68 | 110.77 | 316.53 | 15.26 | 56.07 | 83.85 | 308.96 | 44.42 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |      |       |       |       |       |       |      |       |       |      |
|---------------------------------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|------|
| d_M, Delay for Movement [s/veh] | 50.23 | 32.12 | 0.00 | 54.98 | 31.63 | 23.62 | 55.03 | 48.48 | 0.00 | 51.97 | 34.59 | 0.00 |
| Movement LOS                    | D     | C     |      | D     | C     | C     | E     | D     |      | D     | C     |      |
| d_A, Approach Delay [s/veh]     | 30.96 |       |      | 34.64 |       |       | 31.18 |       |      | 44.90 |       |      |
| Approach LOS                    | C     |       |      | C     |       |       | C     |       |      | D     |       |      |
| d_I, Intersection Delay [s/veh] | 34.02 |       |      |       |       |       |       |       |      |       |       |      |
| Intersection LOS                | C     |       |      |       |       |       |       |       |      |       |       |      |
| Intersection V/C                | 0.625 |       |      |       |       |       |       |       |      |       |       |      |

**Emissions**

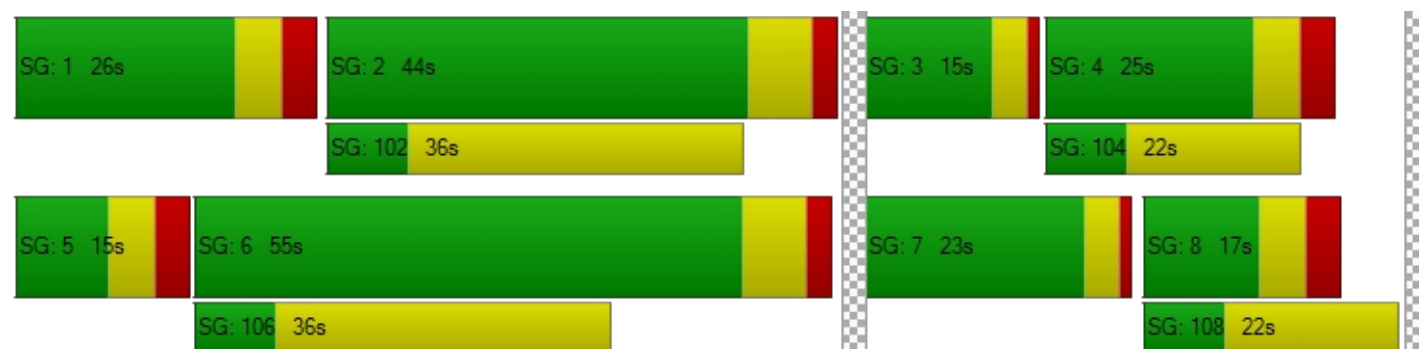
|                              |         |         |        |         |       |        |        |         |        |
|------------------------------|---------|---------|--------|---------|-------|--------|--------|---------|--------|
| Vehicle Miles Traveled [mph] | 192.56  | 773.90  | 17.47  | 111.09  | 1.95  | 8.76   | 14.17  | 116.10  | 19.63  |
| Stops [stops/h]              | 412.34  | 1388.32 | 161.12 | 787.19  | 11.10 | 81.55  | 121.97 | 509.44  | 64.61  |
| Fuel consumption [US gal/h]  | 18.91   | 64.05   | 5.58   | 25.66   | 0.37  | 2.31   | 3.42   | 16.19   | 2.14   |
| CO [g/h]                     | 1322.13 | 4477.05 | 390.02 | 1793.85 | 25.69 | 161.52 | 239.23 | 1131.92 | 149.43 |
| NOx [g/h]                    | 257.24  | 871.07  | 75.88  | 349.02  | 5.00  | 31.43  | 46.55  | 220.23  | 29.07  |
| VOC [g/h]                    | 306.42  | 1037.60 | 90.39  | 415.74  | 5.95  | 37.43  | 55.44  | 262.33  | 34.63  |

**Other Modes**

|                                                          |       |       |       |       |
|----------------------------------------------------------|-------|-------|-------|-------|
| g_Walk,mi, Effective Walk Time [s]                       | 11.0  | 11.0  | 11.0  | 11.0  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  | 0.00  | 0.00  | 0.00  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  | 0.00  | 0.00  | 0.00  |
| d_p, Pedestrian Delay [s]                                | 44.55 | 44.55 | 44.55 | 44.55 |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.665 | 3.601 | 2.888 | 2.913 |
| Crosswalk LOS                                            | D     | D     | C     | C     |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  | 2000  | 2000  | 2000  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 864   | 664   | 182   | 327   |
| d_b, Bicycle Delay [s]                                   | 17.76 | 24.56 | 45.45 | 38.47 |
| I_b,int, Bicycle LOS Score for Intersection              | 2.860 | 2.306 | 1.752 | 2.096 |
| Bicycle LOS                                              | C     | B     | A     | B     |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 2: Meridian Rd/Londonderry Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Signalized      | Delay (sec / veh):        | 31.1  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | C     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.568 |

#### Intersection Setup

| Name                         | Meridian Rd                                                                       |        |        | Meridian Rd                                                                       |        |        | Londonderry Dr                                                                      |        |        | Londonderry Dr                                                                      |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 1      | 1                                                                                 | 0      | 1      | 1                                                                                   | 0      | 1      | 2                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 500.00                                                                            | 100.00 | 515.00 | 365.00                                                                            | 100.00 | 290.00 | 165.00                                                                              | 100.00 | 165.00 | 245.00                                                                              | 100.00 | 155.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 1      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 100.00 | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 270.00 |
| Speed [mph]                  | 55.00                                                                             |        |        | 55.00                                                                             |        |        | 35.00                                                                               |        |        | 35.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Curb Present                 | No                                                                                |        |        | No                                                                                |        |        | No                                                                                  |        |        | No                                                                                  |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

**Volumes**

| Name                                        | Meridian Rd |        |        | Meridian Rd |        |        | Londonderry Dr |        |        | Londonderry Dr |        |        |
|---------------------------------------------|-------------|--------|--------|-------------|--------|--------|----------------|--------|--------|----------------|--------|--------|
| Base Volume Input [veh/h]                   | 124         | 449    | 370    | 111         | 364    | 58     | 35             | 44     | 84     | 287            | 58     | 40     |
| Base Volume Adjustment Factor               | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]               | 2.00        | 2.00   | 2.00   | 2.00        | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   | 2.00           | 2.00   | 2.00   |
| Proportion of CAVs [%]                      | 0.00        |        |        |             |        |        |                |        |        |                |        |        |
| Growth Factor                               | 1.8850      | 1.8850 | 1.8850 | 1.8850      | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 | 1.8850         | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]                   | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Site-Generated Trips [veh/h]                | 0           | 0      | 0      | 0           | 17     | 17     | 20             | 6      | 13     | 5              | 5      | 0      |
| Diverted Trips [veh/h]                      | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Pass-by Trips [veh/h]                       | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Existing Site Adjustment Volume [veh/h]     | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Other Volume [veh/h]                        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Right Turn on Red Volume [veh/h]            | 0           | 0      | 349    | 0           | 0      | 63     | 0              | 0      | 86     | 0              | 0      | 38     |
| Total Hourly Volume [veh/h]                 | 234         | 846    | 348    | 209         | 703    | 63     | 86             | 89     | 85     | 546            | 114    | 37     |
| Peak Hour Factor                            | 0.9500      | 0.9500 | 0.9500 | 0.9500      | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 | 0.9500         | 0.9500 | 0.9500 |
| Other Adjustment Factor                     | 1.0000      | 1.0000 | 1.0000 | 1.0000      | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 | 1.0000         | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]              | 62          | 223    | 92     | 55          | 185    | 17     | 23             | 23     | 22     | 144            | 30     | 10     |
| Total Analysis Volume [veh/h]               | 246         | 891    | 366    | 220         | 740    | 66     | 91             | 94     | 89     | 575            | 120    | 39     |
| Presence of On-Street Parking               | No          |        | No     | No          |        | No     | No             |        | No     | No             |        | No     |
| On-Street Parking Maneuver Rate [/h]        | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| Local Bus Stopping Rate [/h]                | 0           | 0      | 0      | 0           | 0      | 0      | 0              | 0      | 0      | 0              | 0      | 0      |
| v_do, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_di, Inbound Pedestrian Volume crossing m  | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_co, Outbound Pedestrian Volume crossing   | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ci, Inbound Pedestrian Volume crossing mi | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| v_ab, Corner Pedestrian Volume [ped/h]      | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |
| Bicycle Volume [bicycles/h]                 | 0           |        |        | 0           |        |        | 0              |        |        | 0              |        |        |

**Intersection Settings**

|                           |                                       |
|---------------------------|---------------------------------------|
| Located in CBD            | No                                    |
| Signal Coordination Group | -                                     |
| Cycle Length [s]          | 90                                    |
| Active Pattern            | Pattern 1                             |
| Coordination Type         | Time of Day Pattern Isolated          |
| Actuation Type            | Fully actuated                        |
| Offset [s]                | 0.0                                   |
| Offset Reference          | Lead Green - Beginning of First Green |
| Permissive Mode           | SingleBand                            |
| Lost time [s]             | 0.00                                  |

**Phasing & Timing (Basic)**

| Control Type                    | Protecte | Permiss | Permiss | ProtPer | Permiss | Permiss | ProtPer | Permiss | Permiss | Protecte | Permiss | Permiss |
|---------------------------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|
| Signal Group                    | 1        | 6       | 0       | 5       | 2       | 0       | 3       | 8       | 0       | 7        | 4       | 0       |
| Auxiliary Signal Groups         |          |         |         |         |         |         |         |         |         |          |         |         |
| Maximum Green [s]               | 5        | 60      | 0       | 5       | 60      | 0       | 5       | 45      | 0       | 5        | 45      | 0       |
| Amber [s]                       | 3.0      | 5.5     | 0.0     | 3.0     | 5.5     | 0.0     | 3.0     | 4.0     | 0.0     | 3.0      | 4.0     | 0.0     |
| All red [s]                     | 1.0      | 1.5     | 0.0     | 1.0     | 1.5     | 0.0     | 1.0     | 2.0     | 0.0     | 1.0      | 2.0     | 0.0     |
| Walk [s]                        | 0        | 5       | 0       | 0       | 5       | 0       | 0       | 5       | 0       | 0        | 5       | 0       |
| Pedestrian Clearance [s]        | 0        | 11      | 0       | 0       | 18      | 0       | 0       | 16      | 0       | 0        | 21      | 0       |
| Delayed Vehicle Green [s]       | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Rest In Walk                    |          | No      |         |         | No      |         |         | No      |         |          | No      |         |
| I1, Start-Up Lost Time [s]      | 2.0      | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0     | 2.0     | 0.0     | 2.0      | 2.0     | 0.0     |
| I2, Clearance Lost Time [s]     | 2.0      | 5.0     | 0.0     | 2.0     | 5.0     | 0.0     | 2.0     | 4.0     | 0.0     | 2.0      | 4.0     | 0.0     |
| Detector Location [ft]          | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Detector Length [ft]            | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Location [ft] | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| Advanced Detector Length [ft]   | 0.0      | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0     | 0.0      | 0.0     | 0.0     |
| I, Upstream Filtering Factor    | 1.00     | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00    | 1.00     | 1.00    | 1.00    |

**Phasing & Timing: Pattern 1**

|                       |      |     |     |      |     |     |      |     |     |      |     |     |
|-----------------------|------|-----|-----|------|-----|-----|------|-----|-----|------|-----|-----|
| Split [s]             | 24   | 38  | 0   | 16   | 30  | 0   | 13   | 16  | 0   | 20   | 23  | 0   |
| Lead / Lag            | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   | Lead | -   | -   |
| Minimum Green [s]     | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   | 5    | 10  | 0   |
| Vehicle Extension [s] | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 | 3.0  | 3.0 | 0.0 |
| Minimum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Maximum Recall        | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |
| Pedestrian Recall     | No   | No  |     | No   | No  |     | No   | No  |     | No   | No  |     |

**Exclusive Pedestrian Phase**

|                          |   |
|--------------------------|---|
| Pedestrian Signal Group  | 0 |
| Pedestrian Walk [s]      | 0 |
| Pedestrian Clearance [s] | 0 |

**Lane Group Calculations**

| Lane Group                              | L     | C     | R     | L     | C     | R     | L     | C     | R     | L     | C     | R     |
|-----------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| C, Calculated Cycle Length [s]          | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    | 90    |
| L, Total Lost Time per Cycle [s]        | 4.00  | 7.00  | 7.00  | 7.00  | 7.00  | 7.00  | 6.00  | 6.00  | 6.00  | 4.00  | 6.00  | 6.00  |
| l1_p, Permitted Start-Up Lost Time [s]  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| l2, Clearance Lost Time [s]             | 2.00  | 5.00  | 5.00  | 0.00  | 5.00  | 5.00  | 0.00  | 4.00  | 4.00  | 2.00  | 4.00  | 4.00  |
| g_i, Effective Green Time [s]           | 14    | 35    | 35    | 47    | 29    | 29    | 30    | 10    | 10    | 16    | 21    | 21    |
| g / C, Green / Cycle                    | 0.16  | 0.39  | 0.39  | 0.52  | 0.32  | 0.32  | 0.33  | 0.11  | 0.11  | 0.18  | 0.23  | 0.23  |
| (v / s)_i Volume / Saturation Flow Rate | 0.14  | 0.25  | 0.23  | 0.30  | 0.21  | 0.04  | 0.07  | 0.05  | 0.06  | 0.17  | 0.06  | 0.02  |
| s, saturation flow rate [veh/h]         | 1781  | 3560  | 1589  | 735   | 3560  | 1589  | 1354  | 1870  | 1589  | 3459  | 1870  | 1589  |
| c, Capacity [veh/h]                     | 286   | 1376  | 614   | 411   | 1134  | 506   | 500   | 206   | 175   | 615   | 437   | 371   |
| d1, Uniform Delay [s]                   | 36.80 | 22.59 | 22.00 | 15.63 | 26.39 | 21.81 | 21.30 | 37.53 | 37.76 | 36.49 | 28.24 | 27.09 |
| k, delay calibration                    | 0.16  | 0.50  | 0.50  | 0.50  | 0.50  | 0.50  | 0.15  | 0.11  | 0.11  | 0.11  | 0.11  | 0.11  |
| l, Upstream Filtering Factor            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| d2, Incremental Delay [s]               | 10.59 | 2.37  | 4.22  | 4.92  | 2.93  | 0.53  | 0.24  | 1.58  | 2.28  | 7.30  | 0.34  | 0.12  |
| d3, Initial Queue Delay [s]             | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  | 0.00  |
| Rp, platoon ratio                       | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| PF, progression factor                  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |

**Lane Group Results**

|                                       |        |        |        |        |        |       |       |       |       |        |       |       |
|---------------------------------------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|-------|-------|
| X, volume / capacity                  | 0.86   | 0.65   | 0.60   | 0.53   | 0.65   | 0.13  | 0.18  | 0.46  | 0.51  | 0.94   | 0.27  | 0.11  |
| d, Delay for Lane Group [s/veh]       | 47.39  | 24.95  | 26.22  | 20.54  | 29.32  | 22.34 | 21.54 | 39.11 | 40.04 | 43.79  | 28.58 | 27.22 |
| Lane Group LOS                        | D      | C      | C      | C      | C      | C     | C     | D     | D     | D      | C     | C     |
| Critical Lane Group                   | Yes    | No     | No     | No     | Yes    | No    | No    | No    | Yes   | Yes    | No    | No    |
| 50th-Percentile Queue Length [veh/ln] | 5.69   | 7.17   | 6.09   | 2.54   | 6.54   | 0.97  | 1.34  | 1.98  | 1.92  | 6.64   | 2.10  | 0.65  |
| 50th-Percentile Queue Length [ft/ln]  | 142.17 | 179.14 | 152.30 | 63.60  | 163.41 | 24.26 | 33.39 | 49.62 | 47.88 | 165.97 | 52.41 | 16.34 |
| 95th-Percentile Queue Length [veh/ln] | 9.60   | 11.56  | 10.14  | 4.58   | 10.73  | 1.75  | 2.40  | 3.57  | 3.45  | 10.86  | 3.77  | 1.18  |
| 95th-Percentile Queue Length [ft/ln]  | 239.95 | 288.89 | 253.50 | 114.47 | 268.23 | 43.67 | 60.09 | 89.31 | 86.19 | 271.61 | 94.34 | 29.41 |

**Movement, Approach, & Intersection Results**

|                                 |       |       |       |       |       |       |       |       |       |       |       |       |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| d_M, Delay for Movement [s/veh] | 47.39 | 24.95 | 26.22 | 20.54 | 29.32 | 22.34 | 21.54 | 39.11 | 40.04 | 43.79 | 28.58 | 27.22 |
| Movement LOS                    | D     | C     | C     | C     | C     | C     | C     | D     | D     | D     | C     | C     |
| d_A, Approach Delay [s/veh]     | 28.93 |       |       | 26.99 |       |       | 33.58 |       |       | 40.42 |       |       |
| Approach LOS                    | C     |       |       | C     |       |       | C     |       |       | D     |       |       |
| d_I, Intersection Delay [s/veh] | 31.11 |       |       |       |       |       |       |       |       |       |       |       |
| Intersection LOS                | C     |       |       |       |       |       |       |       |       |       |       |       |
| Intersection V/C                | 0.568 |       |       |       |       |       |       |       |       |       |       |       |

**Emissions**

|                              |        |         |        |        |         |        |        |        |        |        |        |       |
|------------------------------|--------|---------|--------|--------|---------|--------|--------|--------|--------|--------|--------|-------|
| Vehicle Miles Traveled [mph] | 80.86  | 292.86  | 120.30 | 54.59  | 183.62  | 16.38  | 29.84  | 30.82  | 29.18  | 87.69  | 18.30  | 5.95  |
| Stops [stops/h]              | 227.48 | 573.24  | 243.68 | 101.75 | 522.91  | 38.82  | 53.42  | 79.39  | 76.61  | 531.10 | 83.85  | 26.14 |
| Fuel consumption [US gal/h]  | 9.30   | 24.97   | 10.50  | 4.64   | 20.27   | 1.57   | 1.94   | 2.52   | 2.41   | 12.46  | 2.03   | 0.64  |
| CO [g/h]                     | 650.22 | 1745.31 | 734.17 | 324.05 | 1416.92 | 109.67 | 135.46 | 176.15 | 168.71 | 870.97 | 141.62 | 44.69 |
| NOx [g/h]                    | 126.51 | 339.57  | 142.84 | 63.05  | 275.68  | 21.34  | 26.36  | 34.27  | 32.83  | 169.46 | 27.55  | 8.69  |
| VOC [g/h]                    | 150.70 | 404.49  | 170.15 | 75.10  | 328.38  | 25.42  | 31.39  | 40.82  | 39.10  | 201.86 | 32.82  | 10.36 |

**Other Modes**

|                                                          |       |  |  |       |  |  |       |  |  |       |  |  |
|----------------------------------------------------------|-------|--|--|-------|--|--|-------|--|--|-------|--|--|
| g_Walk,mi, Effective Walk Time [s]                       | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  | 9.0   |  |  |
| M_corner, Corner Circulation Area [ft <sup>2</sup> /ped] | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  | 0.00  |  |  |
| d_p, Pedestrian Delay [s]                                | 36.45 |  |  | 36.45 |  |  | 36.45 |  |  | 36.45 |  |  |
| I_p,int, Pedestrian LOS Score for Intersectio            | 3.970 |  |  | 3.267 |  |  | 2.498 |  |  | 2.978 |  |  |
| Crosswalk LOS                                            | D     |  |  | C     |  |  | B     |  |  | C     |  |  |
| s_b, Saturation Flow Rate of the bicycle lane            | 2000  |  |  | 2000  |  |  | 2000  |  |  | 2000  |  |  |
| c_b, Capacity of the bicycle lane [bicycles/h]           | 689   |  |  | 511   |  |  | 222   |  |  | 378   |  |  |
| d_b, Bicycle Delay [s]                                   | 19.34 |  |  | 24.94 |  |  | 35.56 |  |  | 29.61 |  |  |
| I_b,int, Bicycle LOS Score for Intersection              | 3.088 |  |  | 2.458 |  |  | 2.154 |  |  | 2.833 |  |  |
| Bicycle LOS                                              | C     |  |  | B     |  |  | B     |  |  | C     |  |  |

**Sequence**

|        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | 3 | 4 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



### Intersection Level Of Service Report

#### Intersection 3: Londonderry Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 14.3  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.018 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        | Londonderry Dr                                                                      |        | Londonderry Dr                                                                      |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|
| Approach                     | Northbound                                                                        |        | Eastbound                                                                           |        | Westbound                                                                           |        |
| Lane Configuration           |  |        |  |        |  |        |
| Turning Movement             | Left                                                                              | Right  | Thru                                                                                | Right  | Left                                                                                | Thru   |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00                                                                               | 12.00  | 12.00                                                                               | 12.00  |
| No. of Lanes in Entry Pocket | 1                                                                                 | 0      | 0                                                                                   | 0      | 1                                                                                   | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00                                                                              | 100.00 | 100.00                                                                              | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0                                                                                   | 0      | 0                                                                                   | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00                                                                                | 0.00   | 0.00                                                                                | 0.00   |
| Speed [mph]                  | 25.00                                                                             |        | 35.00                                                                               |        | 35.00                                                                               |        |
| Grade [%]                    | 0.00                                                                              |        | 0.00                                                                                |        | 0.00                                                                                |        |
| Crosswalk                    | Yes                                                                               |        | Yes                                                                                 |        | Yes                                                                                 |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        | Londonderry Dr |        | Londonderry Dr |        |
|-----------------------------------------|------------------|--------|----------------|--------|----------------|--------|
| Base Volume Input [veh/h]               | 3                | 1      | 142            | 1      | 6              | 168    |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00           | 2.00   | 2.00           | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850         | 1.8850 | 1.8850         | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0              | 0      | 0              | 0      |
| Site-Generated Trips [veh/h]            | 1                | 39     | 0              | 31     | 22             | 0      |
| Diverted Trips [veh/h]                  | 0                | 25     | 0              | 0      | 0              | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0              | 0      | 0              | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0              | 0      | 0              | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0              | 0      | 0              | 0      |
| Total Hourly Volume [veh/h]             | 7                | 66     | 268            | 33     | 33             | 317    |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500         | 0.9500 | 0.9500         | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000         | 1.0000 | 1.0000         | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 2                | 17     | 71             | 9      | 9              | 83     |
| Total Analysis Volume [veh/h]           | 7                | 69     | 282            | 35     | 35             | 334    |
| Pedestrian Volume [ped/h]               | 0                |        | 0              |        | 0              |        |

**Intersection Settings**

|                                    |      |      |      |
|------------------------------------|------|------|------|
| Priority Scheme                    | Stop | Free | Free |
| Flared Lane                        |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |       |      |      |      |      |
|---------------------------------------|-------|-------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.02  | 0.09  | 0.00 | 0.00 | 0.03 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 14.35 | 10.36 | 0.00 | 0.00 | 7.98 | 0.00 |
| Movement LOS                          | B     | B     | A    | A    | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.05  | 0.31  | 0.00 | 0.00 | 0.09 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 1.36  | 7.68  | 0.00 | 0.00 | 2.17 | 0.00 |
| d_A, Approach Delay [s/veh]           | 10.73 |       | 0.00 |      | 0.76 |      |
| Approach LOS                          | B     |       | A    |      | A    |      |
| d_I, Intersection Delay [s/veh]       | 1.44  |       |      |      |      |      |
| Intersection LOS                      | B     |       |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 4: Stapleton Dr/Liberty Grove Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 12.1  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.313 |

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Stapleton Dr                                                                        |        |        | Stapleton Dr                                                                        |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 1      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 45.00                                                                               |        |        | 45.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Stapleton Dr |        |        | Stapleton Dr |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|--------------|--------|--------|--------------|--------|--------|
| Base Volume Input [veh/h]               | 120    | 0      | 0      | 0                | 0      | 1      | 0            | 151    | 0      | 118          | 236    | 57     |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 0.00   | 2.00   | 2.00             | 0.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 0      | 0      | 0                | 0      | 17     | 0            | 0      | 0      | 0            | 0      | 44     |
| Diverted Trips [veh/h]                  | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0            | 0      | 0      | 0            | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 219    | 0                | 0      | 0      | 0            | 0      | 209    | 0            | 0      | 0      |
| Total Hourly Volume [veh/h]             | 226    | 0      | 219    | 0                | 0      | 19     | 0            | 285    | 209    | 222          | 445    | 151    |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 59     | 0      | 58     | 0                | 0      | 5      | 0            | 75     | 55     | 58           | 117    | 40     |
| Total Analysis Volume [veh/h]           | 238    | 0      | 231    | 0                | 0      | 20     | 0            | 300    | 220    | 234          | 468    | 159    |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0            |        |        | 0            |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Stop | Stop | Free | Free |
| Flared Lane                        |      |      |      |      |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           | No   | No   |      |      |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |       |      |       |      |      |      |      |      |      |      |      |      |
|---------------------------------------|-------|------|-------|------|------|------|------|------|------|------|------|------|
| V/C, Movement V/C Ratio               | 0.00  | 0.00 | 0.31  | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh]       | 0.00  | 0.00 | 12.07 | 0.00 | 0.00 | 9.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Movement LOS                          |       |      | B     |      |      | A    |      | A    | A    |      | A    | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.00  | 0.00 | 1.34  | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft/ln]  | 0.00  | 0.00 | 33.42 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh]           | 12.07 |      |       | 9.81 |      |      | 0.00 |      |      | 0.00 |      |      |
| Approach LOS                          | B     |      |       | A    |      |      | A    |      |      | A    |      |      |
| d_I, Intersection Delay [s/veh]       | 2.14  |      |       |      |      |      |      |      |      |      |      |      |
| Intersection LOS                      | B     |      |       |      |      |      |      |      |      |      |      |      |

### Intersection Level Of Service Report

#### Intersection 5: Liberty Grove Dr/Waterbury Dr

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 10.9  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.008 |

#### Intersection Setup

| Name                         | Liberty Grove Dr                                                                  |        |        |                                                                                   |        |        | Waterbury Dr                                                                        |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 30.00                                                                             |        |        | 30.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    | Liberty Grove Dr |        |        |        |        |        | Waterbury Dr |        |        |        |        |        |
|-----------------------------------------|------------------|--------|--------|--------|--------|--------|--------------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 15               | 43     | 0      | 0      | 21     | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00             | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   | 2.00         | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.8850           | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850       | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0                | 22     | 22     | 27     | 9      | 0      | 0            | 0      | 0      | 9      | 0      | 20     |
| Diverted Trips [veh/h]                  | 0                | 0      | 0      | 0      | 0      | 0      | 5            | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0                | 0      | 0      | 0      | 0      | 0      | 0            | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 28               | 103    | 22     | 27     | 49     | 0      | 5            | 0      | 0      | 9      | 0      | 20     |
| Peak Hour Factor                        | 0.9500           | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500       | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000           | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000       | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 7                | 27     | 6      | 7      | 13     | 0      | 1            | 0      | 0      | 2      | 0      | 5      |
| Total Analysis Volume [veh/h]           | 29               | 108    | 23     | 28     | 52     | 0      | 5            | 0      | 0      | 9      | 0      | 21     |
| Pedestrian Volume [ped/h]               | 0                |        |        | 0      |        |        | 0            |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |       |       |      |       |       |      |
|---------------------------------------|------|------|------|------|------|------|-------|-------|------|-------|-------|------|
| V/C, Movement V/C Ratio               | 0.02 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01  | 0.00  | 0.00 | 0.01  | 0.00  | 0.02 |
| d_M, Delay for Movement [s/veh]       | 7.35 | 0.00 | 0.00 | 7.51 | 0.00 | 0.00 | 10.89 | 11.15 | 8.59 | 10.79 | 11.18 | 9.03 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | B     | B     | A    | B     | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.02  | 0.02  | 0.02 | 0.11  | 0.11  | 0.11 |
| 95th-Percentile Queue Length [ft/ln]  | 1.27 | 1.27 | 1.27 | 1.18 | 1.18 | 1.18 | 0.61  | 0.61  | 0.61 | 2.84  | 2.84  | 2.84 |
| d_A, Approach Delay [s/veh]           | 1.33 |      |      | 2.63 |      |      | 10.89 |       |      | 9.56  |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | B     |       |      | A     |       |      |
| d_I, Intersection Delay [s/veh]       | 2.78 |      |      |      |      |      |       |       |      |       |       |      |
| Intersection LOS                      | B    |      |      |      |      |      |       |       |      |       |       |      |

### Intersection Level Of Service Report

#### Intersection 6: Liberty Grove Dr/Salem Ct

|                  |                 |                           |       |
|------------------|-----------------|---------------------------|-------|
| Control Type:    | Two-way stop    | Delay (sec / veh):        | 10.7  |
| Analysis Method: | HCM 7th Edition | Level Of Service:         | B     |
| Analysis Period: | 15 minutes      | Volume to Capacity (v/c): | 0.011 |

#### Intersection Setup

| Name                         |                                                                                   |        |        | Liberty Grove Dr                                                                  |        |        | Salem Ct                                                                            |        |        |                                                                                     |        |        |
|------------------------------|-----------------------------------------------------------------------------------|--------|--------|-----------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|-------------------------------------------------------------------------------------|--------|--------|
| Approach                     | Northbound                                                                        |        |        | Southbound                                                                        |        |        | Eastbound                                                                           |        |        | Westbound                                                                           |        |        |
| Lane Configuration           |  |        |        |  |        |        |  |        |        |  |        |        |
| Turning Movement             | Left                                                                              | Thru   | Right  | Left                                                                              | Thru   | Right  | Left                                                                                | Thru   | Right  | Left                                                                                | Thru   | Right  |
| Lane Width [ft]              | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                             | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  | 12.00                                                                               | 12.00  | 12.00  |
| No. of Lanes in Entry Pocket | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Entry Pocket Length [ft]     | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                            | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 | 100.00                                                                              | 100.00 | 100.00 |
| No. of Lanes in Exit Pocket  | 0                                                                                 | 0      | 0      | 0                                                                                 | 0      | 0      | 0                                                                                   | 0      | 0      | 0                                                                                   | 0      | 0      |
| Exit Pocket Length [ft]      | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                              | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   | 0.00                                                                                | 0.00   | 0.00   |
| Speed [mph]                  | 30.00                                                                             |        |        | 25.00                                                                             |        |        | 25.00                                                                               |        |        | 30.00                                                                               |        |        |
| Grade [%]                    | 0.00                                                                              |        |        | 0.00                                                                              |        |        | 0.00                                                                                |        |        | 0.00                                                                                |        |        |
| Crosswalk                    | Yes                                                                               |        |        | Yes                                                                               |        |        | Yes                                                                                 |        |        | Yes                                                                                 |        |        |

#### Volumes

| Name                                    |        |        |        | Liberty Grove Dr |        |        | Salem Ct |        |        |        |        |        |
|-----------------------------------------|--------|--------|--------|------------------|--------|--------|----------|--------|--------|--------|--------|--------|
| Base Volume Input [veh/h]               | 9      | 36     | 0      | 0                | 17     | 2      | 2        | 0      | 0      | 0      | 0      | 0      |
| Base Volume Adjustment Factor           | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%]           | 2.00   | 2.00   | 2.00   | 2.00             | 2.00   | 2.00   | 2.00     | 2.00   | 2.00   | 2.00   | 2.00   | 2.00   |
| Growth Factor                           | 1.8850 | 1.8850 | 1.8850 | 1.8850           | 1.8850 | 1.8850 | 1.8850   | 1.8850 | 1.8850 | 1.8850 | 1.8850 | 1.8850 |
| In-Process Volume [veh/h]               | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Site-Generated Trips [veh/h]            | 0      | 20     | 22     | 27               | 27     | 0      | 0        | 0      | 0      | 9      | 0      | 20     |
| Diverted Trips [veh/h]                  | 0      | 5      | 0      | 0                | 0      | 0      | 3        | 0      | 0      | 0      | 0      | 0      |
| Pass-by Trips [veh/h]                   | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Existing Site Adjustment Volume [veh/h] | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Other Volume [veh/h]                    | 0      | 0      | 0      | 0                | 0      | 0      | 0        | 0      | 0      | 0      | 0      | 0      |
| Total Hourly Volume [veh/h]             | 17     | 93     | 22     | 27               | 59     | 4      | 7        | 0      | 0      | 9      | 0      | 20     |
| Peak Hour Factor                        | 0.9500 | 0.9500 | 0.9500 | 0.9500           | 0.9500 | 0.9500 | 0.9500   | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 0.9500 |
| Other Adjustment Factor                 | 1.0000 | 1.0000 | 1.0000 | 1.0000           | 1.0000 | 1.0000 | 1.0000   | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h]          | 4      | 24     | 6      | 7                | 16     | 1      | 2        | 0      | 0      | 2      | 0      | 5      |
| Total Analysis Volume [veh/h]           | 18     | 98     | 23     | 28               | 62     | 4      | 7        | 0      | 0      | 9      | 0      | 21     |
| Pedestrian Volume [ped/h]               | 0      |        |        | 0                |        |        | 0        |        |        | 0      |        |        |

**Intersection Settings**

|                                    |      |      |      |      |
|------------------------------------|------|------|------|------|
| Priority Scheme                    | Free | Free | Stop | Stop |
| Flared Lane                        |      |      | No   | No   |
| Storage Area [veh]                 | 0    | 0    | 0    | 0    |
| Two-Stage Gap Acceptance           |      |      | No   | No   |
| Number of Storage Spaces in Median | 0    | 0    | 0    | 0    |

**Movement, Approach, & Intersection Results**

|                                       |      |      |      |      |      |      |       |       |      |       |       |      |
|---------------------------------------|------|------|------|------|------|------|-------|-------|------|-------|-------|------|
| V/C, Movement V/C Ratio               | 0.01 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.01  | 0.00  | 0.00 | 0.01  | 0.00  | 0.02 |
| d_M, Delay for Movement [s/veh]       | 7.37 | 0.00 | 0.00 | 7.49 | 0.00 | 0.00 | 10.69 | 10.96 | 8.66 | 10.57 | 10.99 | 8.97 |
| Movement LOS                          | A    | A    | A    | A    | A    | A    | B     | B     | A    | B     | B     | A    |
| 95th-Percentile Queue Length [veh/ln] | 0.03 | 0.03 | 0.03 | 0.05 | 0.05 | 0.05 | 0.03  | 0.03  | 0.03 | 0.11  | 0.11  | 0.11 |
| 95th-Percentile Queue Length [ft/ln]  | 0.79 | 0.79 | 0.79 | 1.20 | 1.20 | 1.20 | 0.83  | 0.83  | 0.83 | 2.78  | 2.78  | 2.78 |
| d_A, Approach Delay [s/veh]           | 0.95 |      |      | 2.23 |      |      | 10.69 |       |      | 9.45  |       |      |
| Approach LOS                          | A    |      |      | A    |      |      | B     |       |      | A     |       |      |
| d_I, Intersection Delay [s/veh]       | 2.59 |      |      |      |      |      |       |       |      |       |       |      |
| Intersection LOS                      | B    |      |      |      |      |      |       |       |      |       |       |      |

## Signal Warrants Report For Intersection 3: Londonderry Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S    |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |
|------|---------------|-----|---------------|
|      | E             | W   | S             |
| 1    | 350           | 301 | 73            |
| 2    | 340           | 292 | 71            |
| 3    | 333           | 286 | 69            |
| 4    | 312           | 268 | 65            |
| 5    | 277           | 238 | 58            |
| 6    | 273           | 235 | 57            |
| 7    | 270           | 232 | 56            |
| 8    | 245           | 211 | 51            |
| 9    | 241           | 208 | 50            |
| 10   | 238           | 205 | 50            |
| 11   | 207           | 178 | 43            |
| 12   | 193           | 166 | 40            |
| 13   | 189           | 163 | 39            |
| 14   | 140           | 120 | 29            |
| 15   | 140           | 120 | 29            |
| 16   | 98            | 84  | 20            |
| 17   | 56            | 48  | 12            |
| 18   | 56            | 48  | 12            |
| 19   | 32            | 27  | 7             |
| 20   | 18            | 15  | 4             |
| 21   | 11            | 9   | 2             |
| 22   | 4             | 3   | 1             |
| 23   | 4             | 3   | 1             |
| 24   | 4             | 3   | 1             |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 2             | 651    | 2            | 73     | No                    | No  | No  | No  | No                    | No  | Yes | Yes | No        | No          |
| 2         | 2             | 632    | 2            | 71     | No                    | No  | No  | No  | No                    | No  | Yes | Yes | No        | No          |
| 3         | 2             | 619    | 2            | 69     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 4         | 2             | 580    | 2            | 65     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 5         | 2             | 515    | 2            | 58     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 6         | 2             | 508    | 2            | 57     | No                    | No  | No  | No  | No                    | No  | No  | Yes | No        | No          |
| 7         | 2             | 502    | 2            | 56     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 2             | 456    | 2            | 51     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 2             | 449    | 2            | 50     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 2             | 443    | 2            | 50     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 2             | 385    | 2            | 43     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 2             | 359    | 2            | 40     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 2             | 352    | 2            | 39     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 2             | 260    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 2             | 260    | 2            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 2             | 182    | 2            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 2             | 104    | 2            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 2             | 104    | 2            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 2             | 59     | 2            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 2             | 33     | 2            | 4      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 2             | 20     | 2            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 2             | 7      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 2             | 7      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 2             | 7      | 2            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 2   | 6   | 0         | 0           |

## Warrant 3 Condition A

|                                                          |           |
|----------------------------------------------------------|-----------|
| Orientation                                              | S         |
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 10.7      |
| Number of Lanes on Minor Street Approach                 | 2         |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:13      |
| Delay Condition Met                                      | No        |
| Volume on Minor Street Approach During Same Hour         | 73        |
| High Minor Volume Condition Met                          | No        |
| Total Entering Volume on All Approaches During Same Hour | 724       |
| Number of Approaches on Intersection                     | 3         |
| Total Volume Condition Met                               | Yes       |
| Warrant Met for Approach                                 | No        |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |

## Signal Warrants Report For Intersection 4: Stapleton Dr/Liberty Grove Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | Yes  |
| #2      | Four Hour Vehicular Volume  | Yes  |
| #3      | Peak Hour                   | Yes  |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | E, W |
| Minor Approaches    | S, N |
| Speed > 40mph       | Yes  |
| Population < 10,000 | No   |
| Warrant Factor      | 70%  |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |     | Minor Streets |    |
|------|---------------|-----|---------------|----|
|      | E             | W   | S             | N  |
| 1    | 596           | 494 | 219           | 19 |
| 2    | 578           | 479 | 212           | 18 |
| 3    | 566           | 469 | 208           | 18 |
| 4    | 530           | 440 | 195           | 17 |
| 5    | 471           | 390 | 173           | 15 |
| 6    | 465           | 385 | 171           | 15 |
| 7    | 459           | 380 | 169           | 15 |
| 8    | 417           | 346 | 153           | 13 |
| 9    | 411           | 341 | 151           | 13 |
| 10   | 405           | 336 | 149           | 13 |
| 11   | 352           | 291 | 129           | 11 |
| 12   | 328           | 272 | 120           | 10 |
| 13   | 322           | 267 | 118           | 10 |
| 14   | 238           | 198 | 88            | 8  |
| 15   | 238           | 198 | 88            | 8  |
| 16   | 167           | 138 | 61            | 5  |
| 17   | 95            | 79  | 35            | 3  |
| 18   | 95            | 79  | 35            | 3  |
| 19   | 54            | 44  | 20            | 2  |
| 20   | 30            | 25  | 11            | 1  |
| 21   | 18            | 15  | 7             | 1  |
| 22   | 6             | 5   | 2             | 0  |
| 23   | 6             | 5   | 2             | 0  |
| 24   | 6             | 5   | 2             | 0  |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 3             | 1090   | 1            | 219    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 2         | 3             | 1057   | 1            | 212    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 3         | 3             | 1035   | 1            | 208    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 4         | 3             | 970    | 1            | 195    | Yes                   | Yes | Yes | Yes | Yes                   | Yes | Yes | Yes | Yes       | Yes         |
| 5         | 3             | 861    | 1            | 173    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | Yes         |
| 6         | 3             | 850    | 1            | 171    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | Yes         |
| 7         | 3             | 839    | 1            | 169    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | Yes         |
| 8         | 3             | 763    | 1            | 153    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 9         | 3             | 752    | 1            | 151    | Yes                   | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 10        | 3             | 741    | 1            | 149    | No                    | Yes | Yes | Yes | No                    | Yes | Yes | Yes | Yes       | No          |
| 11        | 3             | 643    | 1            | 129    | No                    | Yes | Yes | Yes | No                    | No  | Yes | Yes | Yes       | No          |
| 12        | 3             | 600    | 1            | 120    | No                    | Yes | Yes | Yes | No                    | No  | No  | Yes | No        | No          |
| 13        | 3             | 589    | 1            | 118    | No                    | No  | Yes | Yes | No                    | No  | No  | Yes | No        | No          |
| 14        | 3             | 436    | 1            | 88     | No                    | No  | No  | Yes | No                    | No  | No  | No  | No        | No          |
| 15        | 3             | 436    | 1            | 88     | No                    | No  | No  | Yes | No                    | No  | No  | No  | No        | No          |
| 16        | 3             | 305    | 1            | 61     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 3             | 174    | 1            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 3             | 174    | 1            | 35     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 3             | 98     | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 3             | 55     | 1            | 11     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 3             | 33     | 1            | 7      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 3             | 11     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 3             | 11     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 3             | 11     | 1            | 2      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 9                     | 12  | 13  | 15  | 4                     | 10  | 11  | 13  | 11        | 7           |

## Warrant 3 Condition A

| Orientation                                              | S         | N    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 12.1      | 9.8  |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:44      | 0:03 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 219       | 19   |
| High Minor Volume Condition Met                          | Yes       | No   |
| Total Entering Volume on All Approaches During Same Hour | 1328      | 1328 |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | Yes       | Yes  |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 5: Liberty Grove Dr/Waterbury Dr

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 153           | 76 | 29            | 5 |
| 2    | 148           | 74 | 28            | 5 |
| 3    | 145           | 72 | 28            | 5 |
| 4    | 136           | 68 | 26            | 4 |
| 5    | 121           | 60 | 23            | 4 |
| 6    | 119           | 59 | 23            | 4 |
| 7    | 118           | 59 | 22            | 4 |
| 8    | 107           | 53 | 20            | 4 |
| 9    | 106           | 52 | 20            | 3 |
| 10   | 104           | 52 | 20            | 3 |
| 11   | 90            | 45 | 17            | 3 |
| 12   | 84            | 42 | 16            | 3 |
| 13   | 83            | 41 | 16            | 3 |
| 14   | 61            | 30 | 12            | 2 |
| 15   | 61            | 30 | 12            | 2 |
| 16   | 43            | 21 | 8             | 1 |
| 17   | 24            | 12 | 5             | 1 |
| 18   | 24            | 12 | 5             | 1 |
| 19   | 14            | 7  | 3             | 0 |
| 20   | 8             | 4  | 1             | 0 |
| 21   | 5             | 2  | 1             | 0 |
| 22   | 2             | 1  | 0             | 0 |
| 23   | 2             | 1  | 0             | 0 |
| 24   | 2             | 1  | 0             | 0 |

## Warrant Analysis by Hour

| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 229    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 222    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 217    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 204    | 1            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 181    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 178    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 177    | 1            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 160    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 158    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 156    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 135    | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 126    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 124    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 91     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 91     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 64     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 36     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 36     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 21     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 12     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 7      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 3      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.6       | 10.9 |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      | 0:00 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 29        | 5    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 263       | 263  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## Signal Warrants Report For Intersection 6: Liberty Grove Dr/Salem Ct

## Warrants Summary

| Warrant | Name                        | Met? |
|---------|-----------------------------|------|
| #1      | Eight Hour Vehicular Volume | No   |
| #2      | Four Hour Vehicular Volume  | No   |
| #3      | Peak Hour                   | No   |

## Intersection Warrants Parameters

|                     |      |
|---------------------|------|
| Major Approaches    | S, N |
| Minor Approaches    | E, W |
| Speed > 40mph       | No   |
| Population < 10,000 | No   |
| Warrant Factor      | 100% |

## Warrant Analysis Traffic Volumes

| Hour | Major Streets |    | Minor Streets |   |
|------|---------------|----|---------------|---|
|      | S             | N  | E             | W |
| 1    | 132           | 90 | 29            | 7 |
| 2    | 128           | 87 | 28            | 7 |
| 3    | 125           | 86 | 28            | 7 |
| 4    | 117           | 80 | 26            | 6 |
| 5    | 104           | 71 | 23            | 6 |
| 6    | 103           | 70 | 23            | 5 |
| 7    | 102           | 69 | 22            | 5 |
| 8    | 92            | 63 | 20            | 5 |
| 9    | 91            | 62 | 20            | 5 |
| 10   | 90            | 61 | 20            | 5 |
| 11   | 78            | 53 | 17            | 4 |
| 12   | 73            | 50 | 16            | 4 |
| 13   | 71            | 49 | 16            | 4 |
| 14   | 53            | 36 | 12            | 3 |
| 15   | 53            | 36 | 12            | 3 |
| 16   | 37            | 25 | 8             | 2 |
| 17   | 21            | 14 | 5             | 1 |
| 18   | 21            | 14 | 5             | 1 |
| 19   | 12            | 8  | 3             | 1 |
| 20   | 7             | 5  | 1             | 0 |
| 21   | 4             | 3  | 1             | 0 |
| 22   | 1             | 1  | 0             | 0 |
| 23   | 1             | 1  | 0             | 0 |
| 24   | 1             | 1  | 0             | 0 |

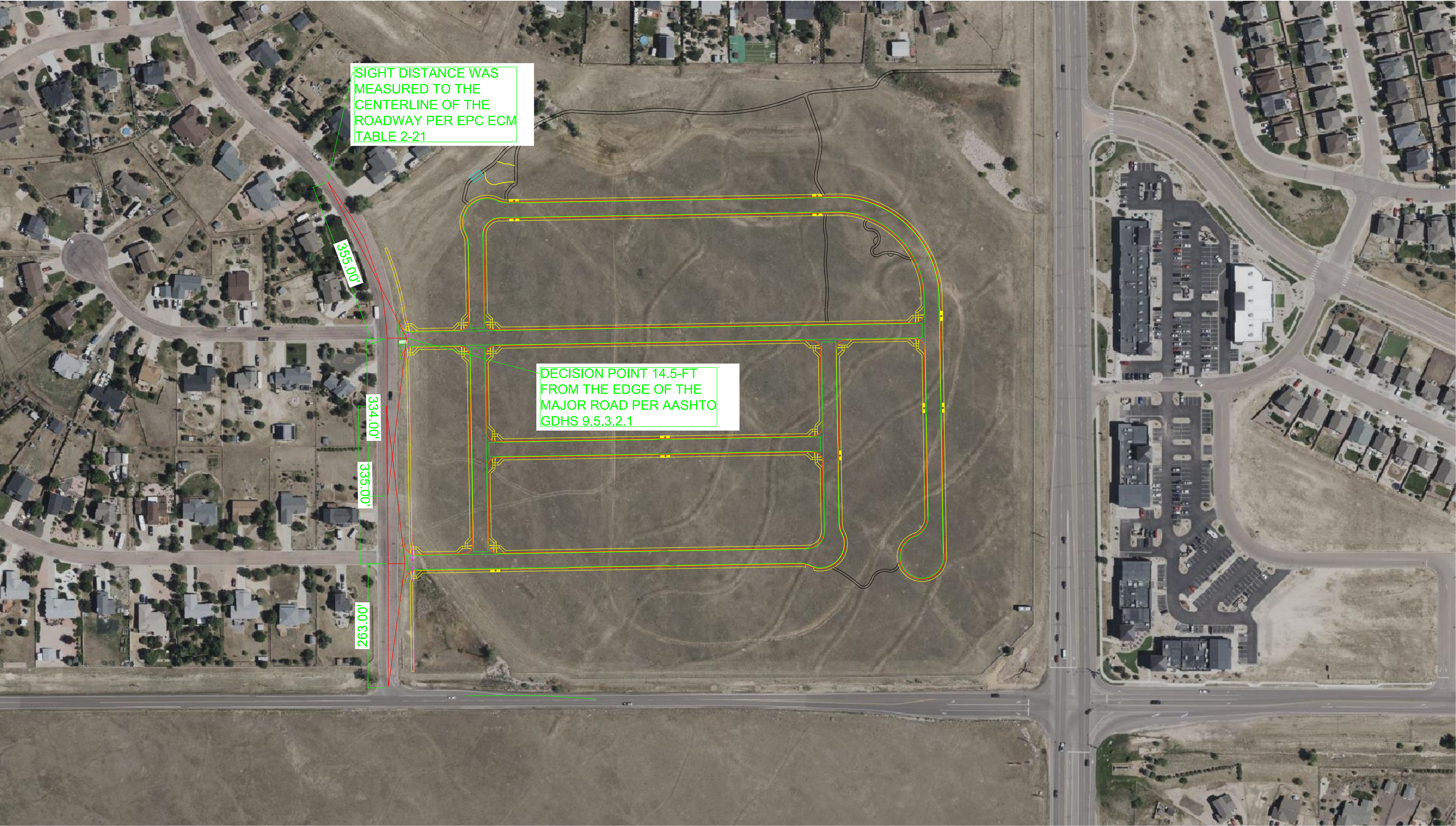
## Warrant Analysis by Hour

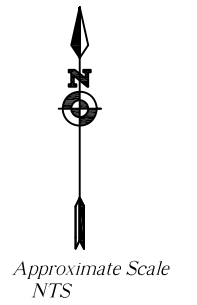
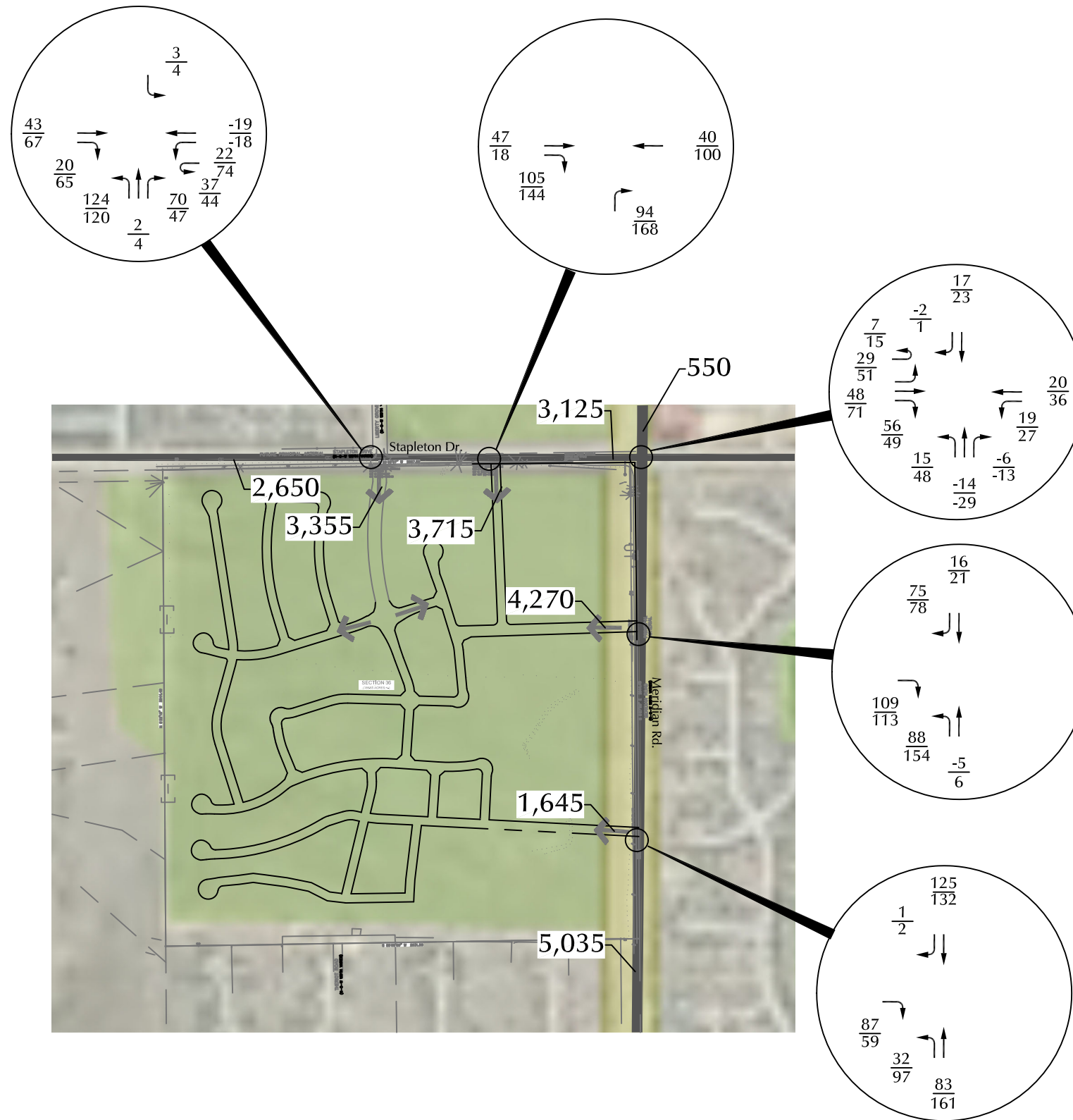
| Hour      | Major Streets |        | Minor Street |        | Warrant 1 Condition A |     |     |     | Warrant 1 Condition B |     |     |     | Warrant 2 | Warrant 3   |
|-----------|---------------|--------|--------------|--------|-----------------------|-----|-----|-----|-----------------------|-----|-----|-----|-----------|-------------|
|           | Number        | Volume | Number       | Volume | 100%                  | 80% | 70% | 56% | 100%                  | 80% | 70% | 56% |           | Condition B |
| 1         | 1             | 222    | 1            | 29     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 2         | 1             | 215    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 3         | 1             | 211    | 1            | 28     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 4         | 1             | 197    | 1            | 26     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 5         | 1             | 175    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 6         | 1             | 173    | 1            | 23     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 7         | 1             | 171    | 1            | 22     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 8         | 1             | 155    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 9         | 1             | 153    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 10        | 1             | 151    | 1            | 20     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 11        | 1             | 131    | 1            | 17     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 12        | 1             | 123    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 13        | 1             | 120    | 1            | 16     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 14        | 1             | 89     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 15        | 1             | 89     | 1            | 12     | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 16        | 1             | 62     | 1            | 8      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 17        | 1             | 35     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 18        | 1             | 35     | 1            | 5      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 19        | 1             | 20     | 1            | 3      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 20        | 1             | 12     | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 21        | 1             | 7      | 1            | 1      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 22        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 23        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| 24        | 1             | 2      | 1            | 0      | No                    | No  | No  | No  | No                    | No  | No  | No  | No        | No          |
| Hours Met |               |        |              |        | 0                     | 0   | 0   | 0   | 0                     | 0   | 0   | 0   | 0         | 0           |

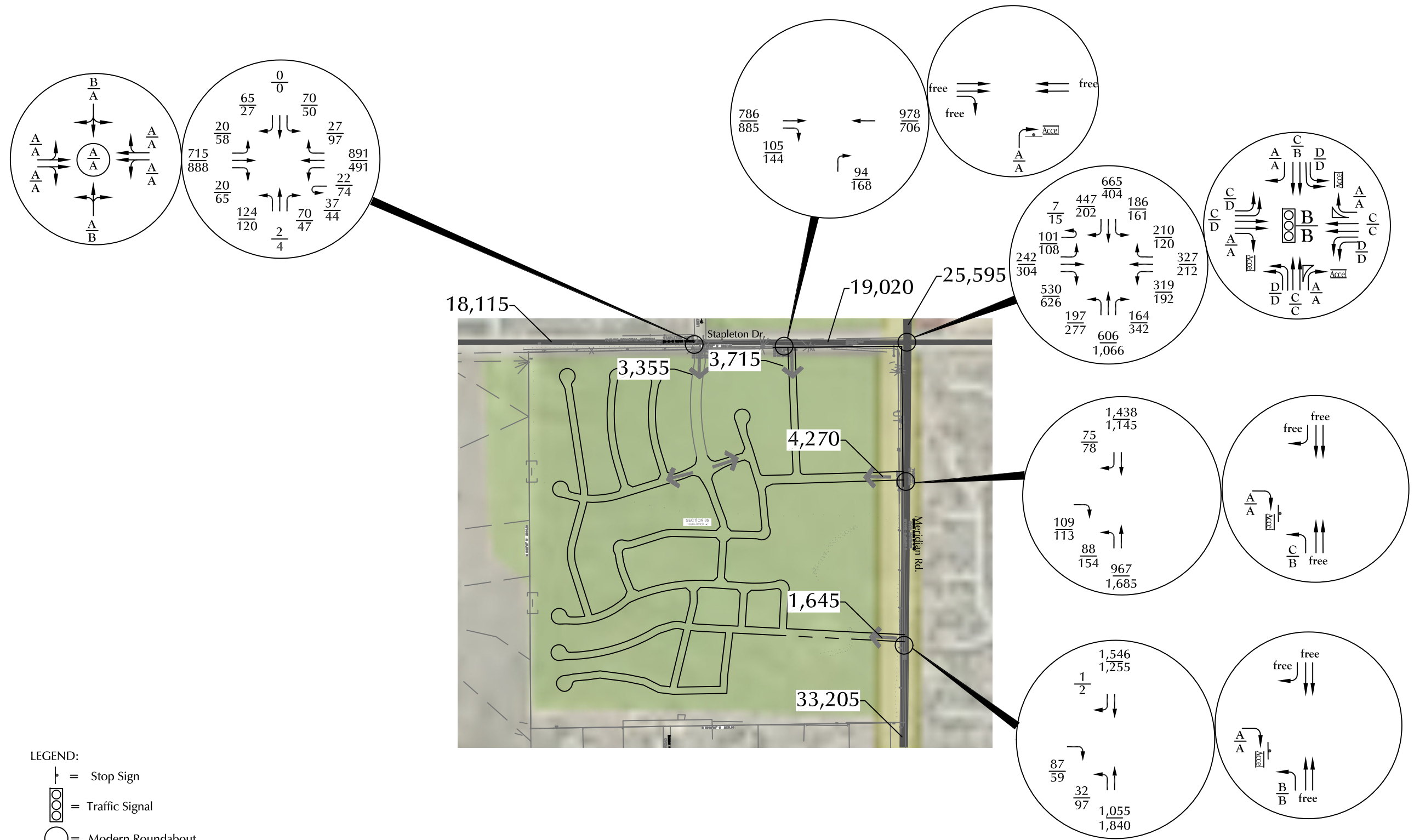
## Warrant 3 Condition A

| Orientation                                              | E         | W    |
|----------------------------------------------------------|-----------|------|
| Total Stopped Delay Per Vehicle on Minor Approach (s)    | 9.5       | 10.7 |
| Number of Lanes on Minor Street Approach                 | 1         | 1    |
| VehicleHours of Stopped Delay on Minor Approach (h:mm)   | 0:04      | 0:01 |
| Delay Condition Met                                      | No        | No   |
| Volume on Minor Street Approach During Same Hour         | 29        | 7    |
| High Minor Volume Condition Met                          | No        | No   |
| Total Entering Volume on All Approaches During Same Hour | 258       | 258  |
| Number of Approaches on Intersection                     | 4         | 4    |
| Total Volume Condition Met                               | No        | No   |
| Warrant Met for Approach                                 | No        | No   |
| <b>Warrant Met for Intersection</b>                      | <b>No</b> |      |

## **Appendix F – Supporting Documents**







- LEGEND:
- = Stop Sign
  - = Traffic Signal
  - = Modern Roundabout
  - $\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (vehicles per hour)  
PM Weekday Peak-Hour Traffic (vehicles per hour)
  - $\frac{A}{B}$  = AM Individual Movement Peak-Hour Level of Service  
PM Individual Movement Peak-Hour Level of Service
  - $\frac{C}{C}$  = AM Entire Intersection Peak-Hour Level of Service  
PM Entire Intersection Peak-Hour Level of Service
  - X,XXX = Average Weekday Traffic (vehicles per day)

Figure 11  
 2042 Total Traffic, Lane  
 Geometry, Traffic Control and Level of Service  
 Autumn Acres (LSC #S224050)

