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Engineering Manager

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El Paso County Department of Public Works
Development Services



FALCON RESERVE

PCD FILE No. SP252 & P255

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

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.



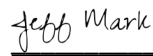
Navid Shafieirad, P.E. #66350

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

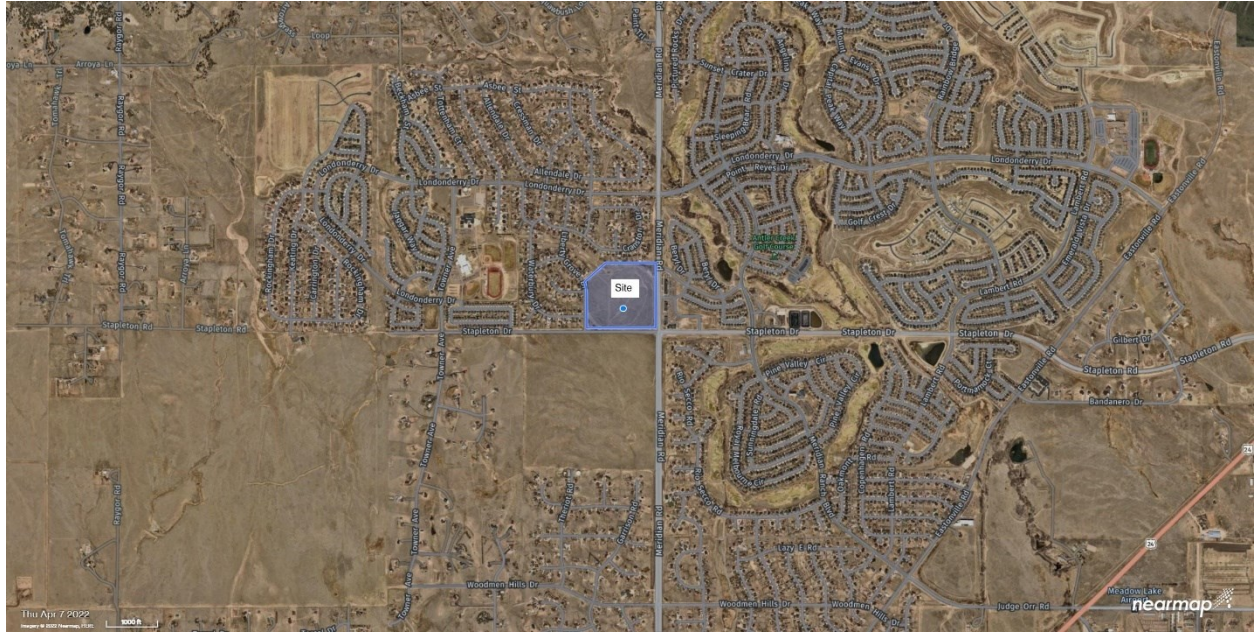
Falcon reserve (The Project) is a proposed 37.9-acre development located at the northwest corner of Meridian Road/Stapleton Drive in unincorporated El Paso County. The project consists of 160 single-family detached dwelling units.

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.

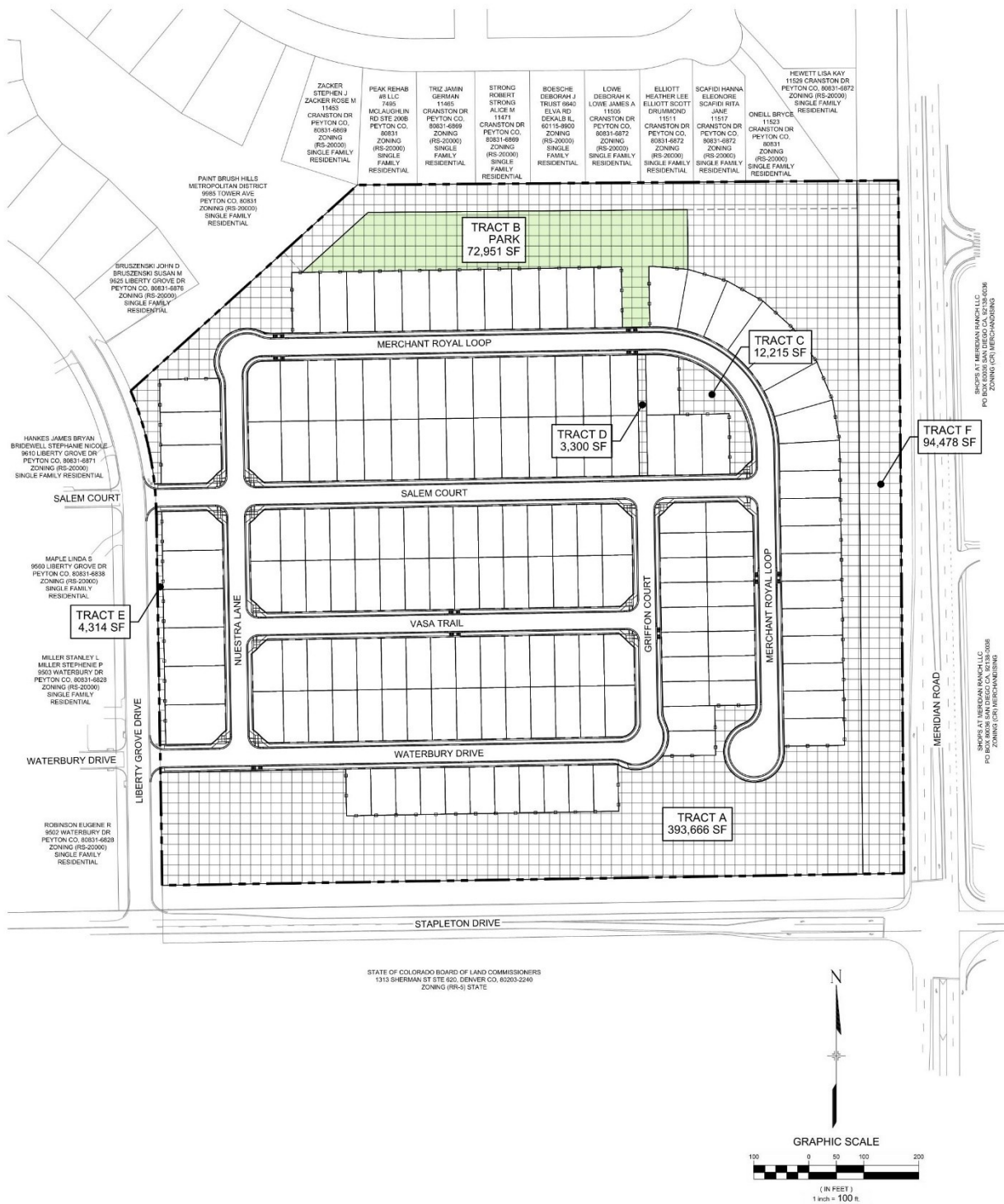
Figure 1. Vicinity Map



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.

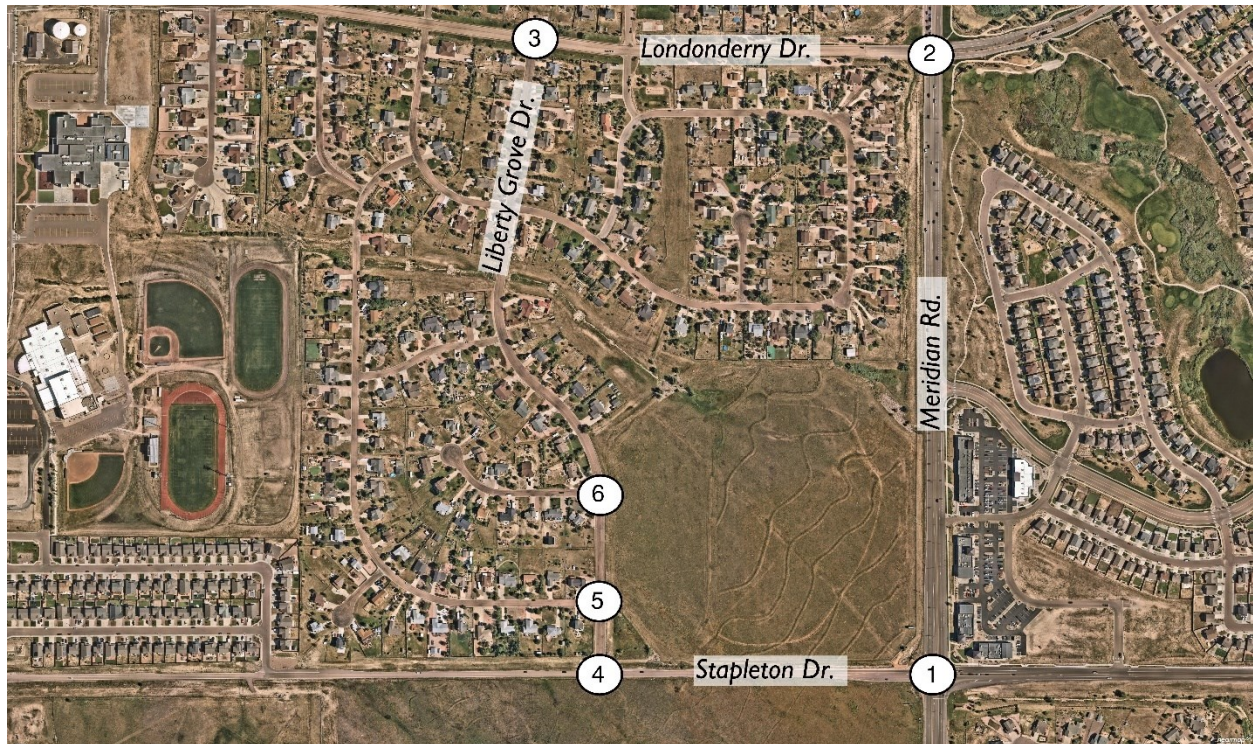
The construction of the project will help to improve the continuity of sidewalk, curb, and gutter along Liberty Grove. Stapleton Road sidewalk is anticipated in the Briargate Parkway/Stapleton Road Corridor Preservation Plan Study.

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

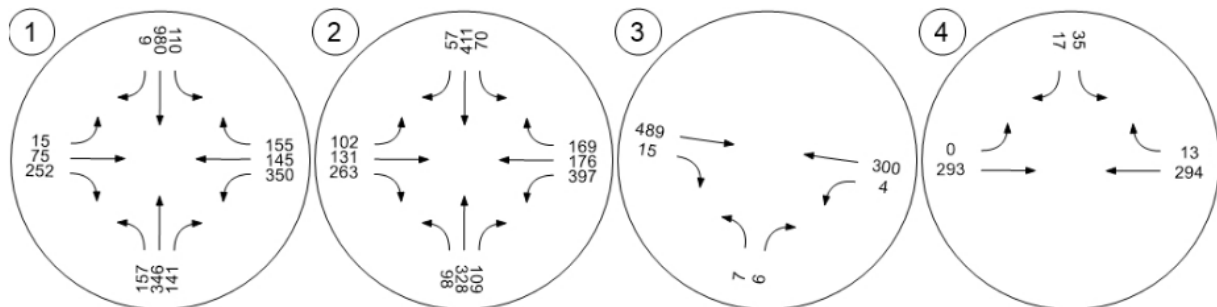
- Meridian Road/Stapleton Drive
- Meridian Road/Londonderry Drive
- Liberty Grove Drive/Stapleton Drive
- Liberty Grove Drive/Waterbury Drive
- Liberty Grove Drive/Salem Court
- Liberty Grove Drive/Londonderry Drive

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

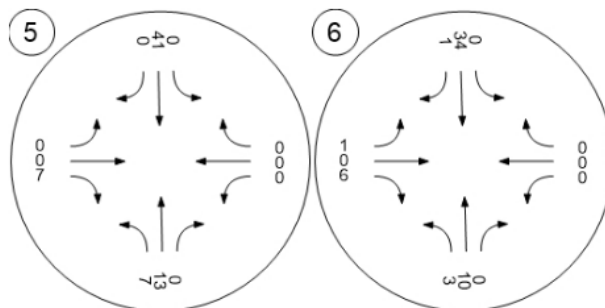
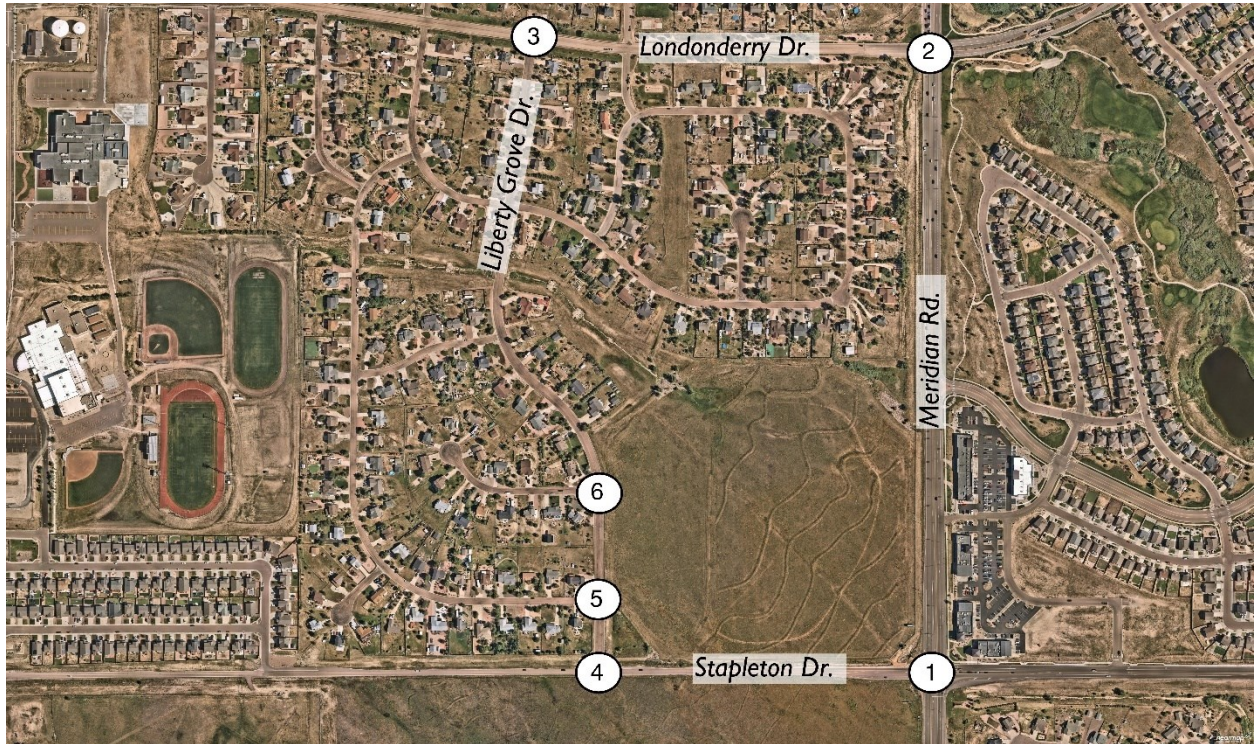
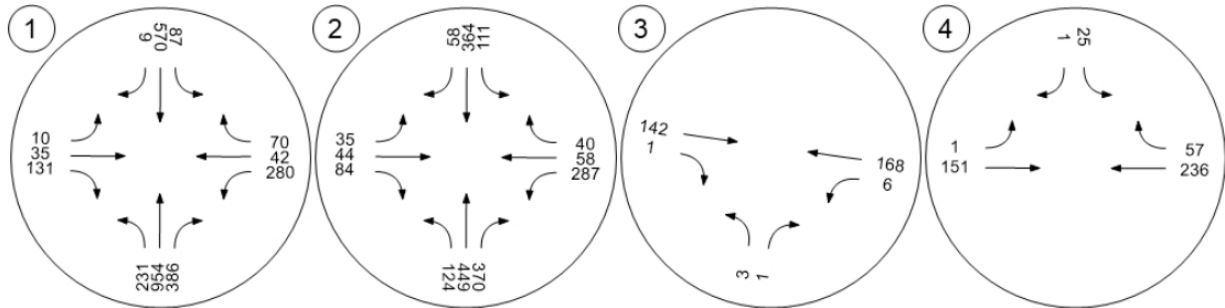


Figure 4. Existing Conditions Traffic Volumes (PM Peak Hour)



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

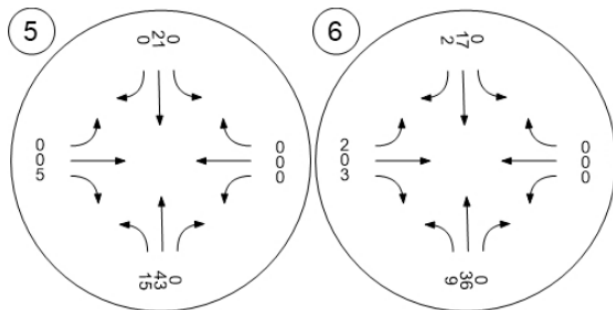
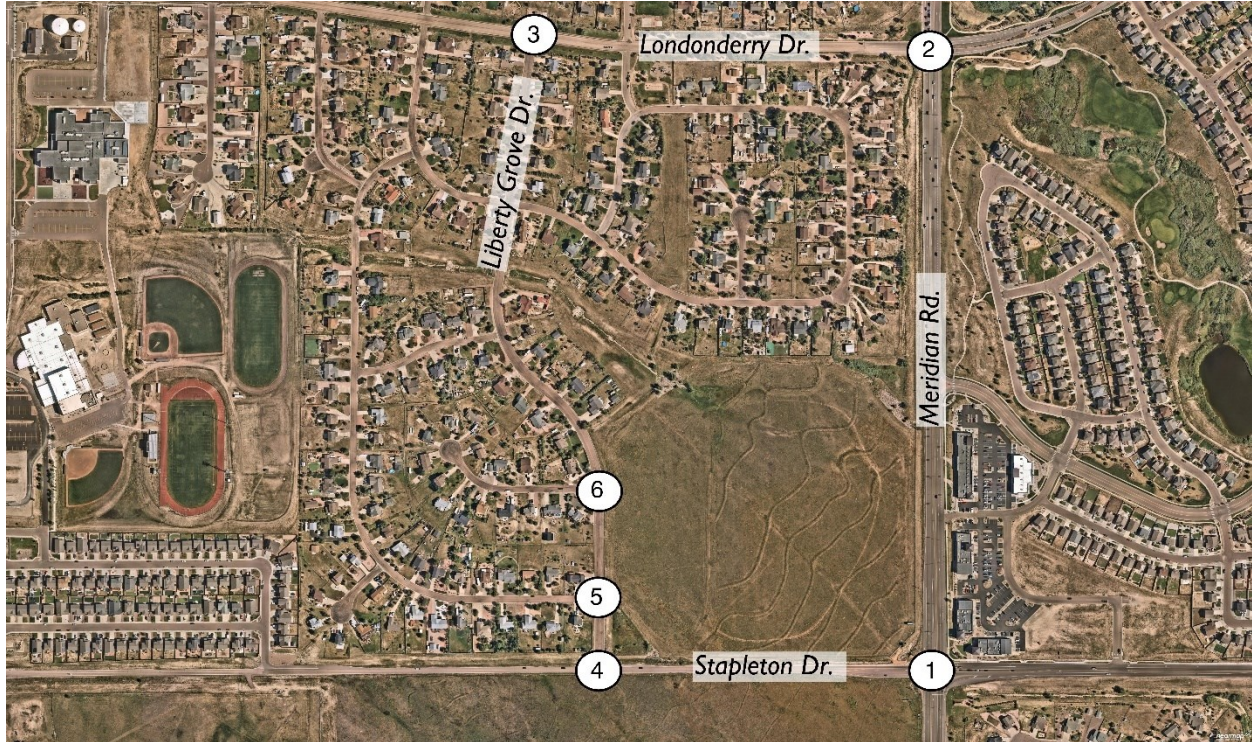


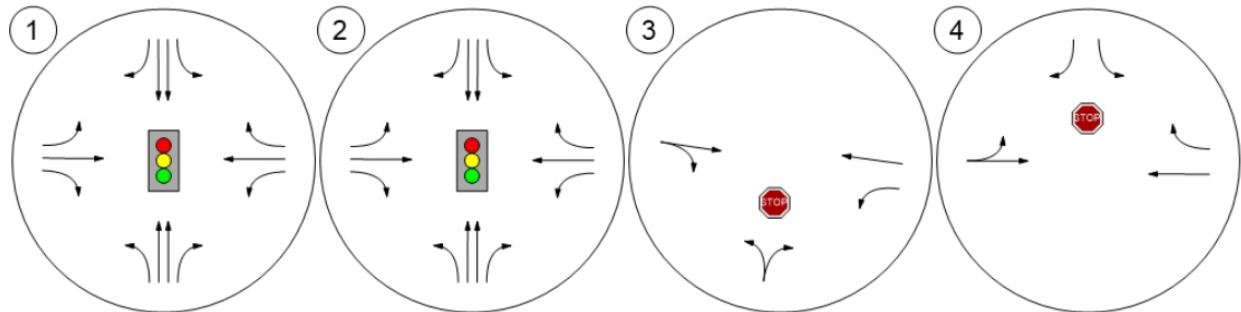
Figure 5. Existing Conditions Daily Traffic Volumes and Roadway Classification



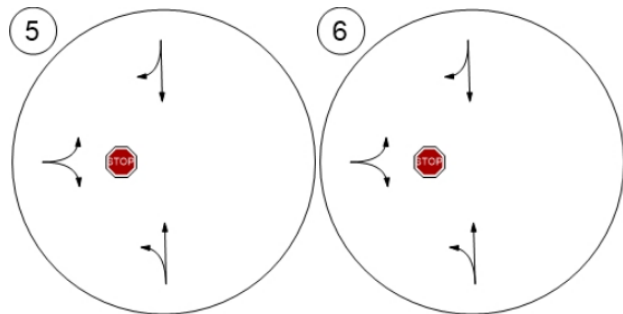
Figure 6. Existing Conditions Intersection Configurations



Meridian Road/Stapleton Driv 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.

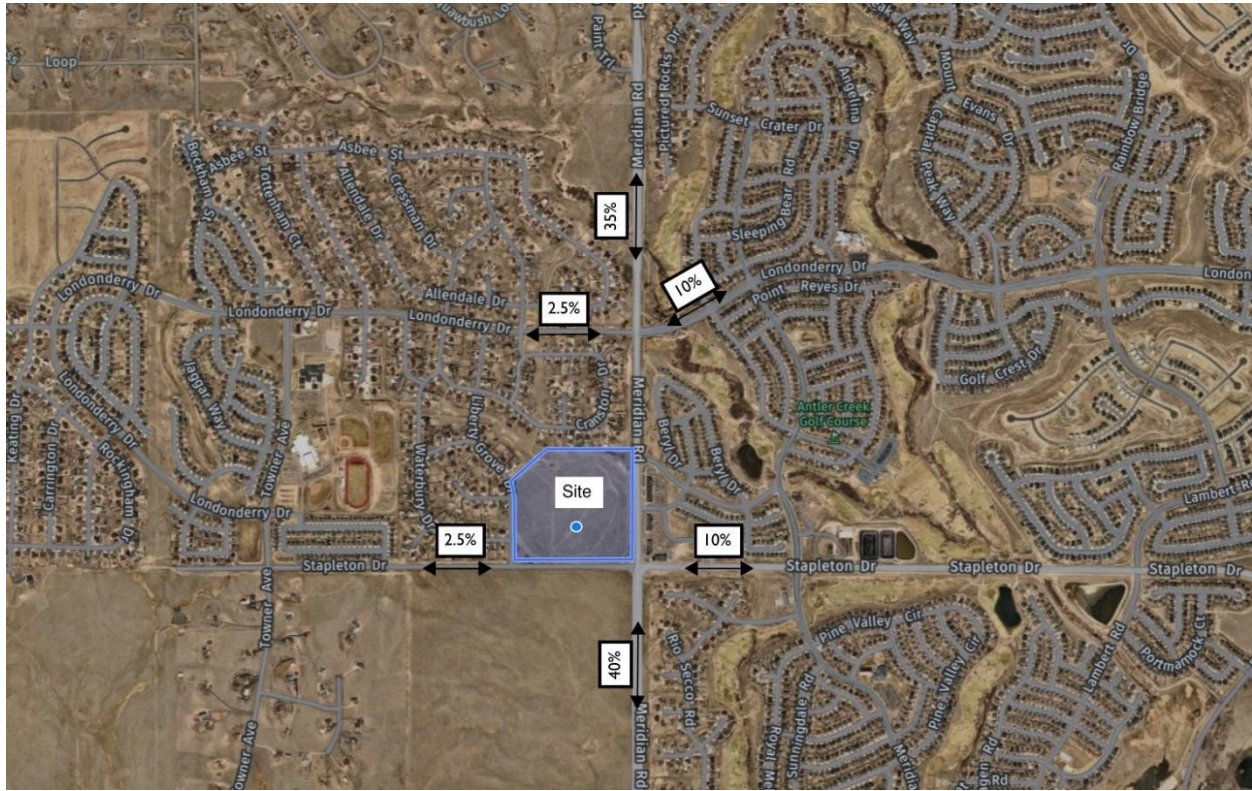
Table 4. Falcon Reserve Trip Generation

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

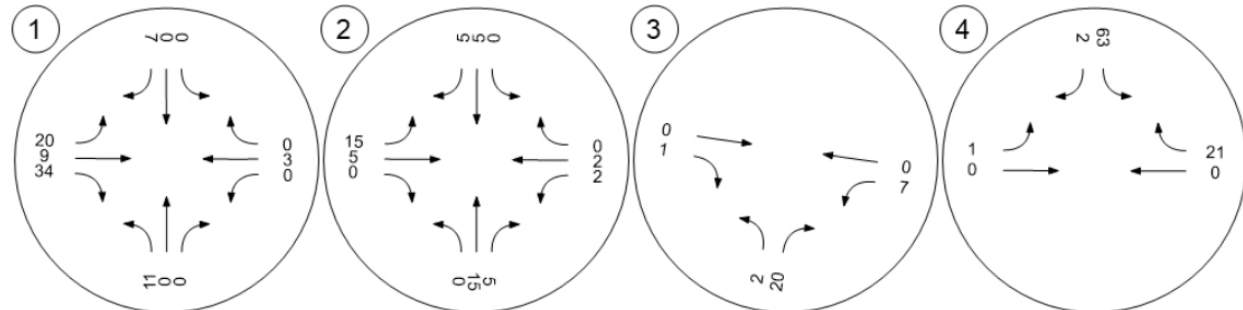


The short term site trips for the AM and PM peak hours are shown in Figure 8 and Figure 9, respectively. The daily site trips are shown in Figure 10.

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

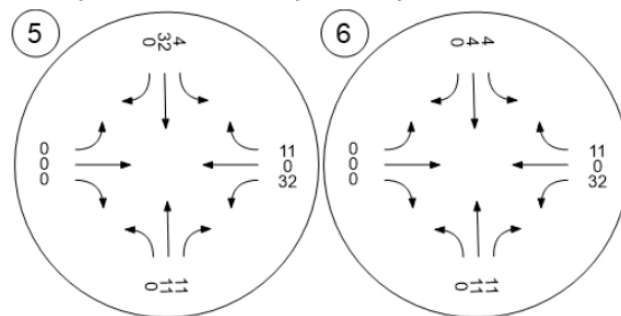
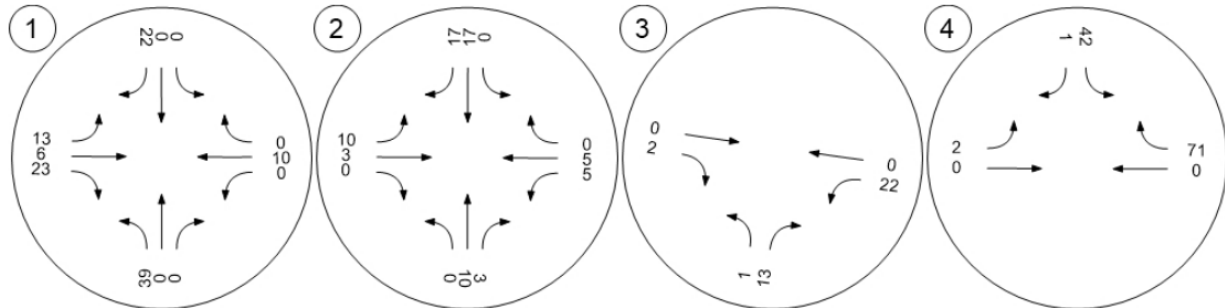


Figure 9. Falcon Reserve Project Trips Short Term (PM Peak Hour)



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

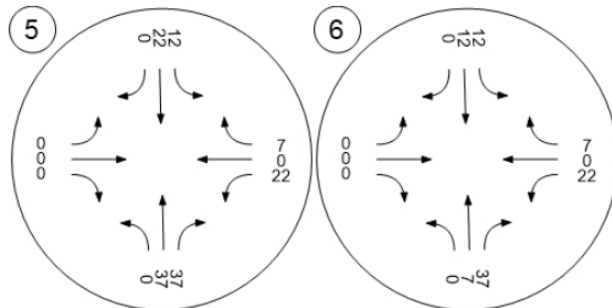


Figure 10. Falcon Reserve Daily Trips (Short Term)

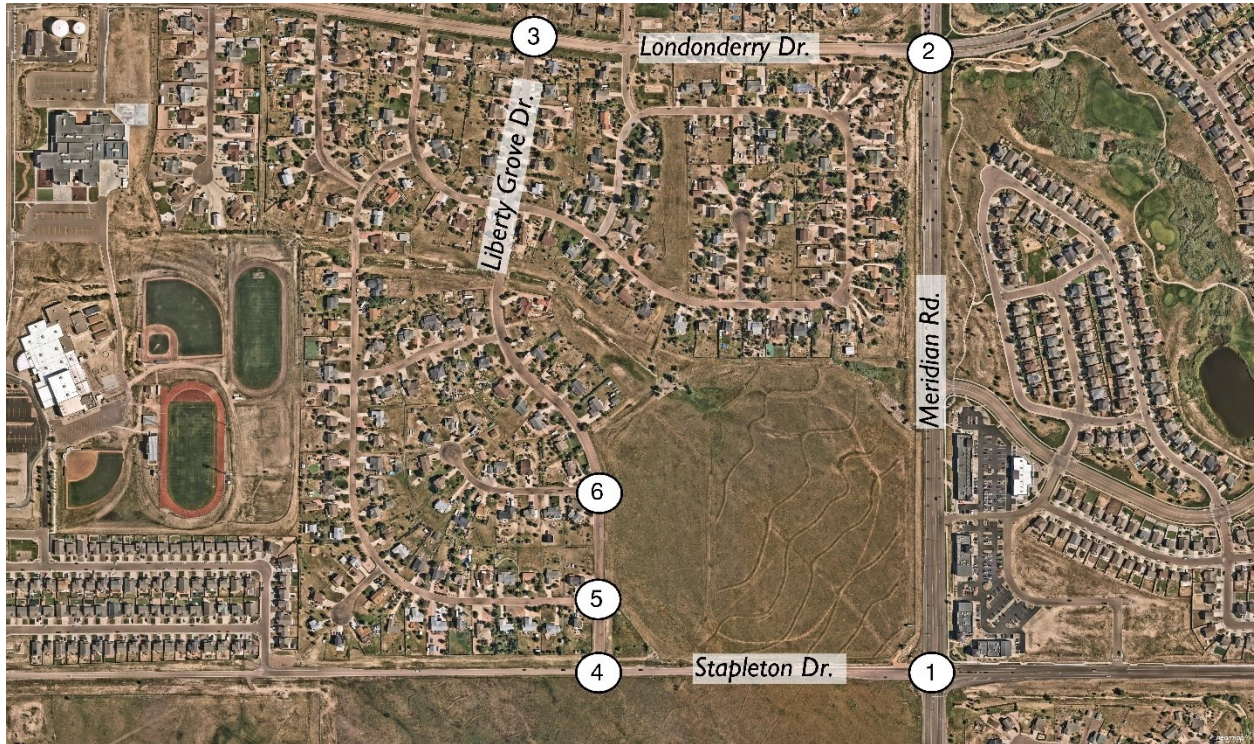
Traffic Analysis

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

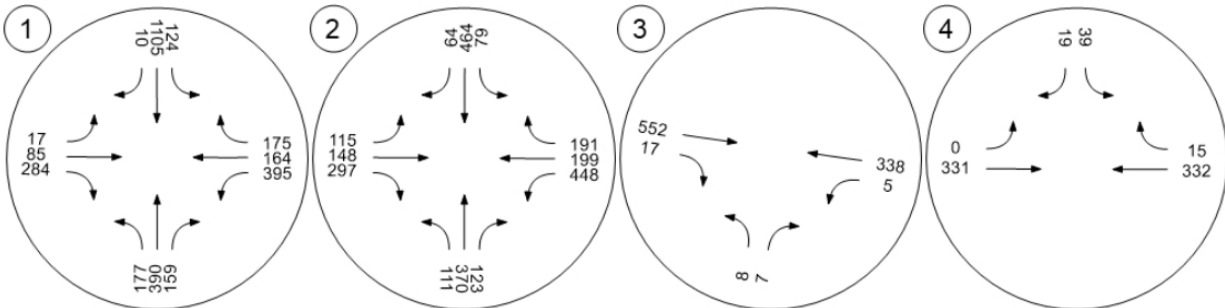
Buildout (2028) No Project Conditions

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

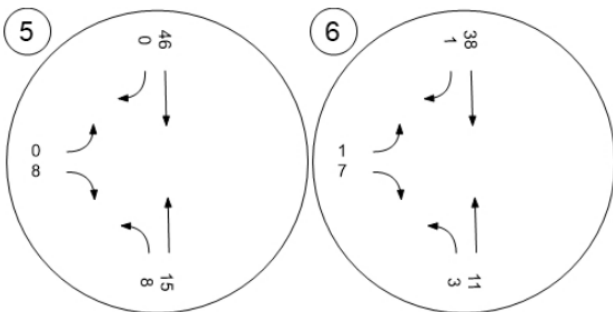
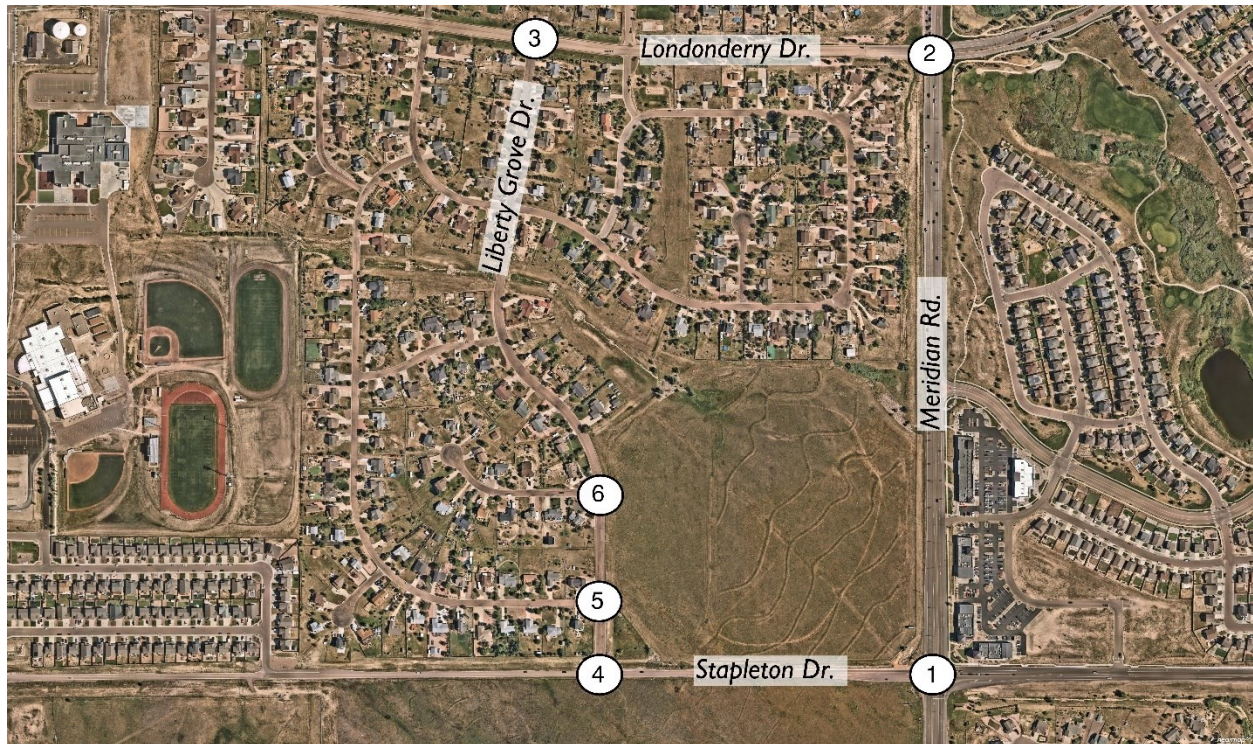
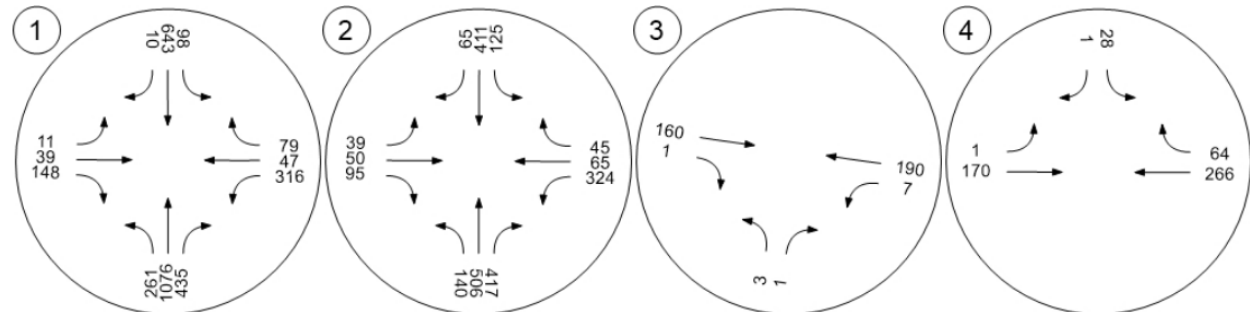


Figure 12. Buildout (2028) No Project Traffic Volumes (PM Peak Hour)



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

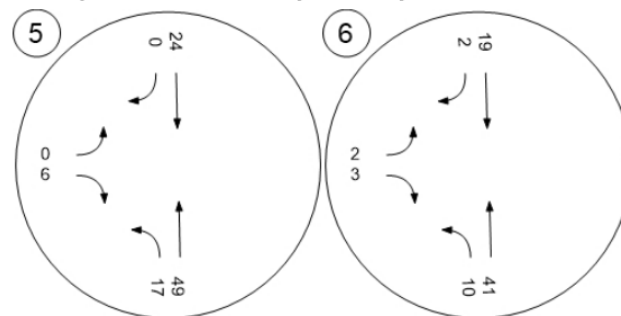
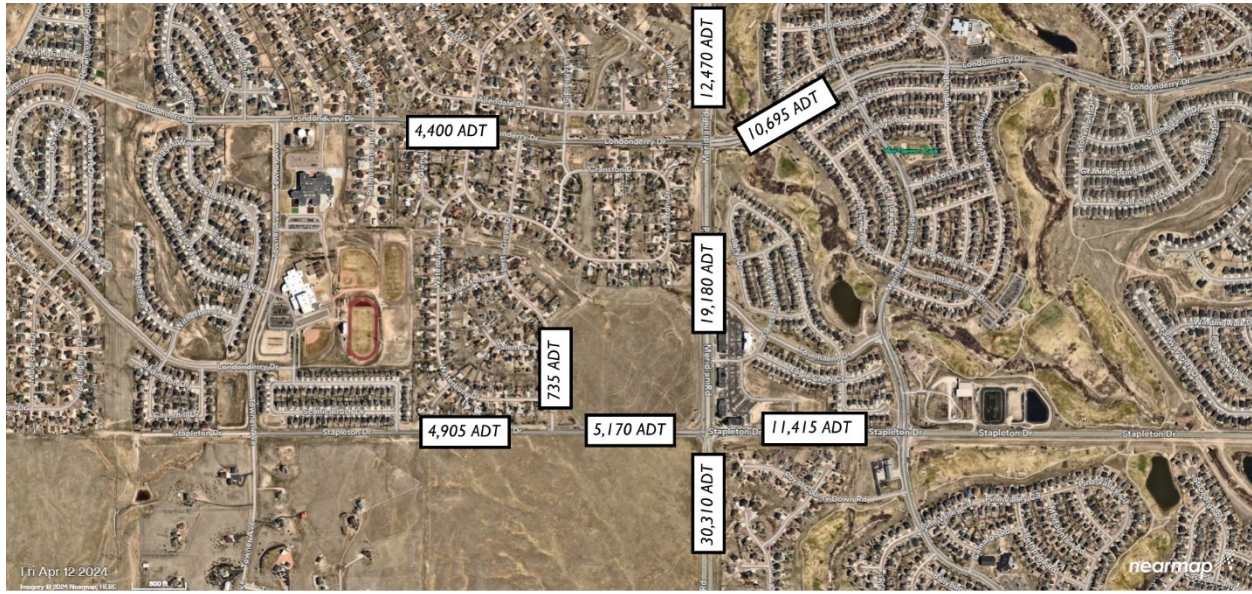


Figure 13. Buildout (2028) No Project Daily Traffic



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

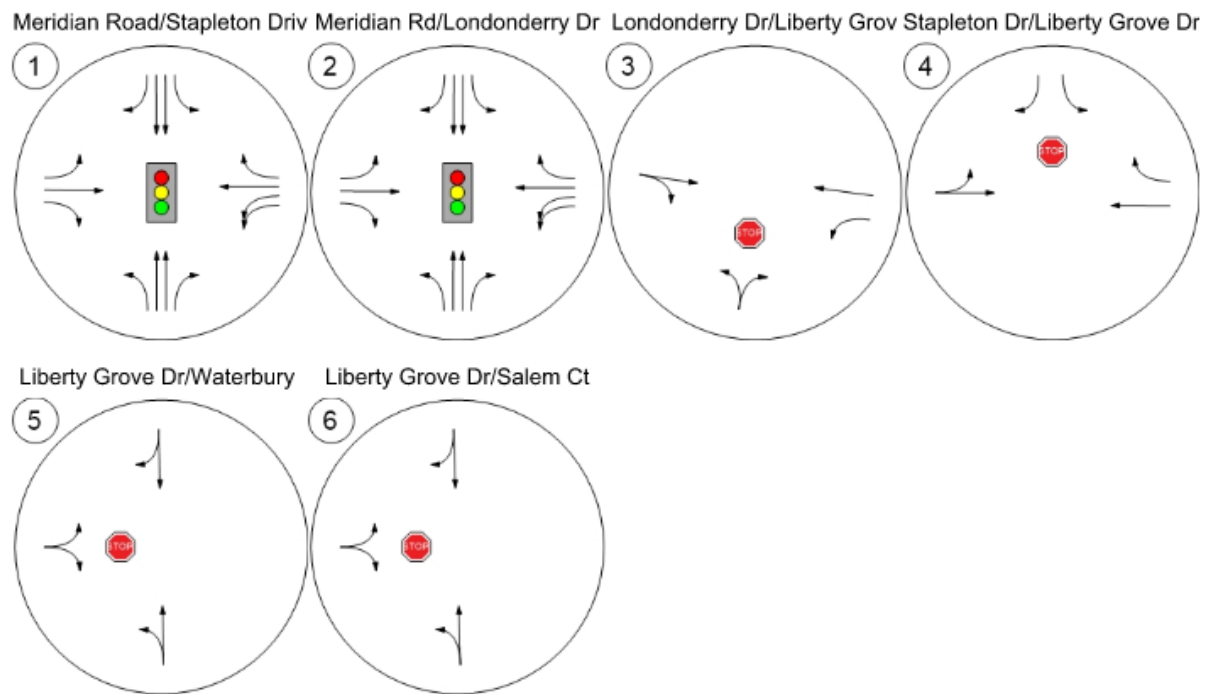
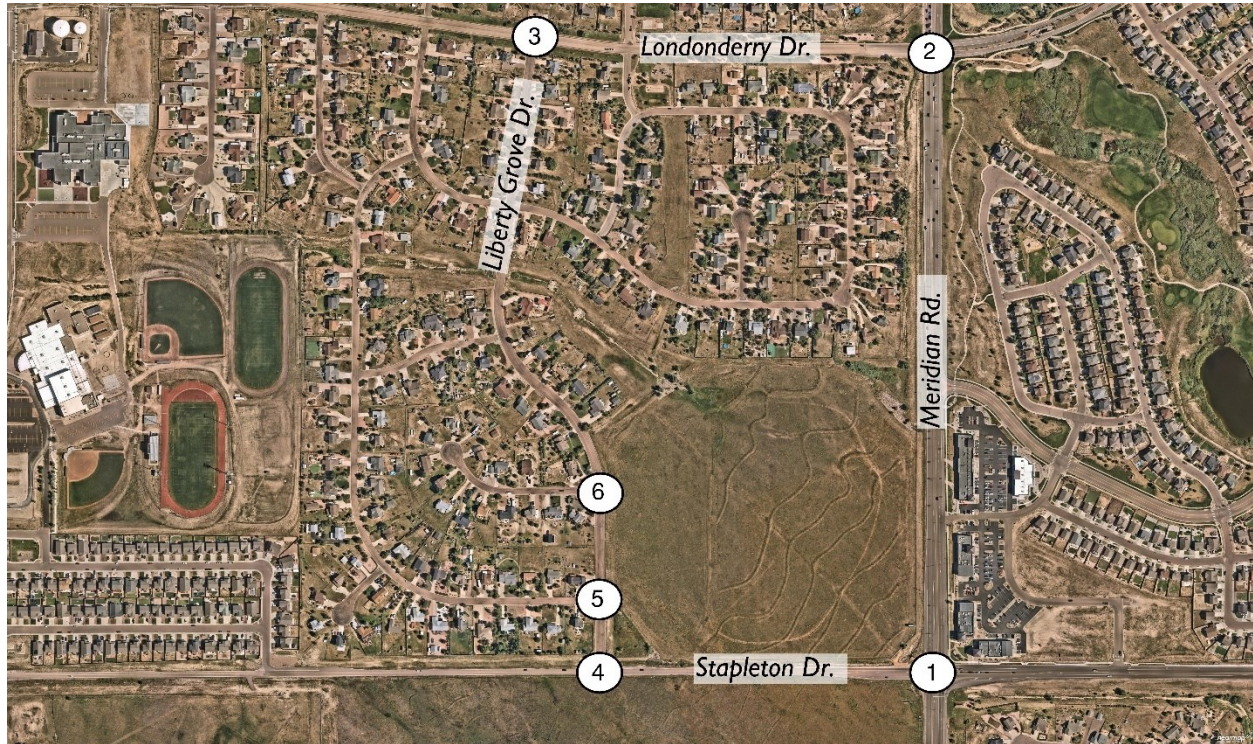


Table 5. Buildout (2028) No Project Intersection Operations (AM Peak Hour)

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.

Buildout (2028) With Project Conditions

Buildout traffic volumes with the project traffic added are shown in Figure 15 and Figure 16 for AM peak hour and PM peak hour. The daily traffic volumes are shown in Figure 17. The intersection configurations are shown in Figure 18.

Figure 15. Buildout (2028) With Project Traffic Volumes (AM Peak Hour)

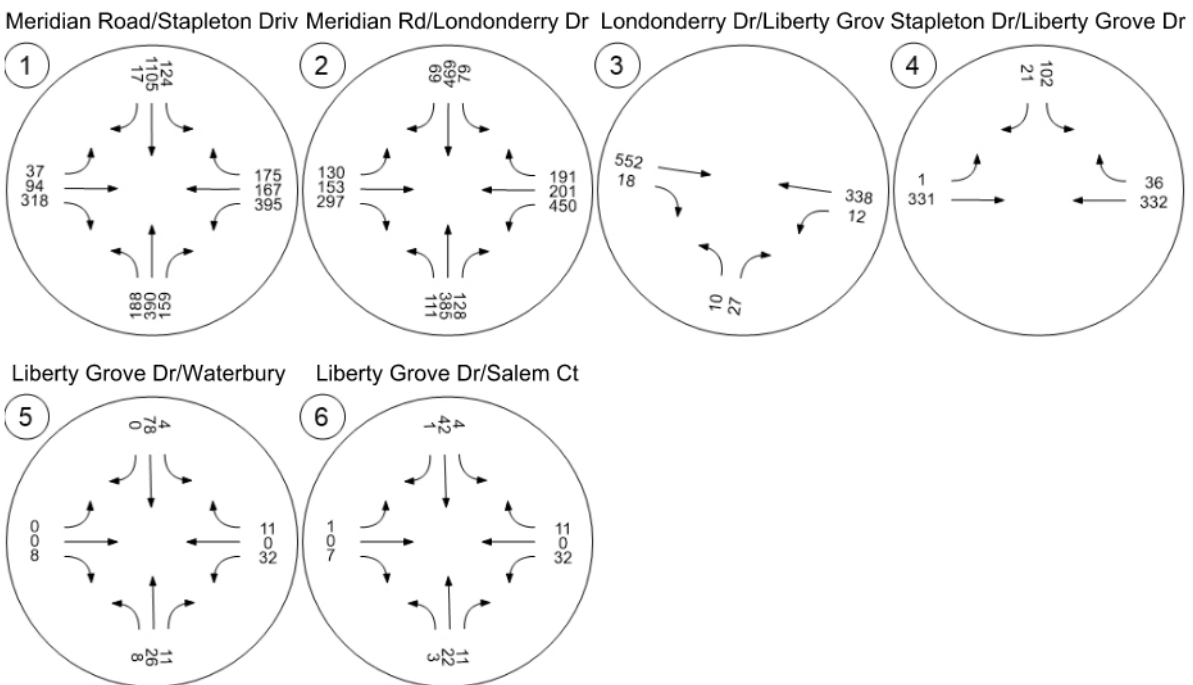
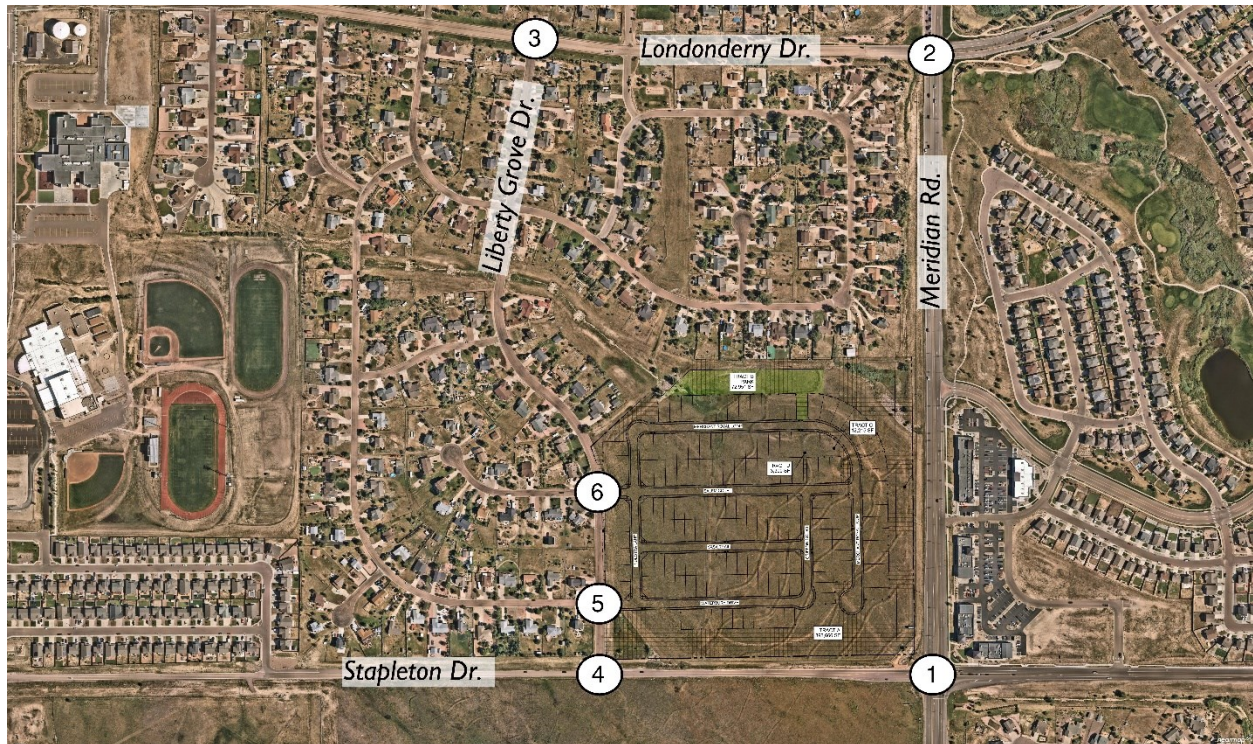
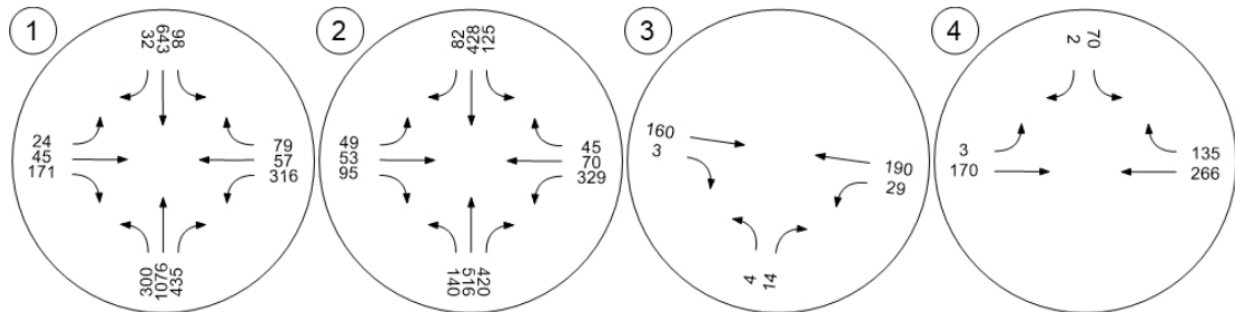


Figure 16. Buildout (2028) With Project Traffic Volumes (PM Peak Hour)



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

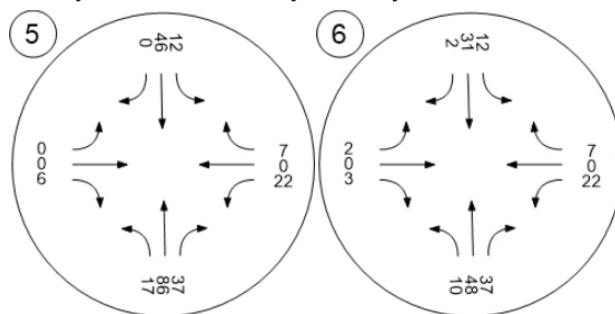


Figure 17. Buildout (2028) With Project Daily Traffic Volumes

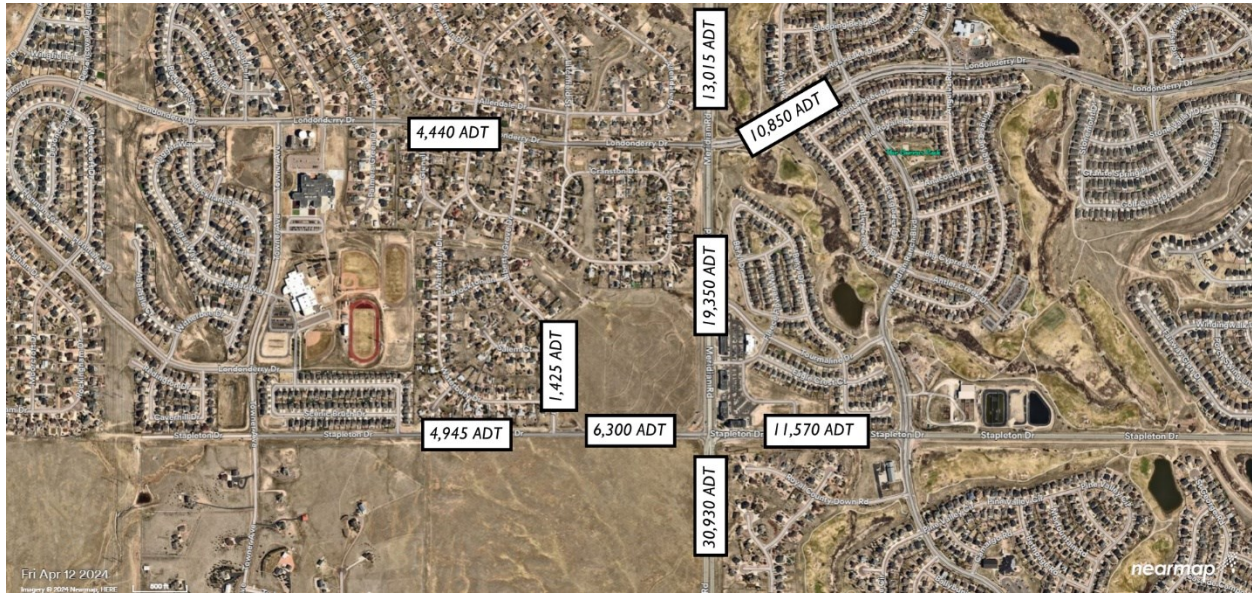
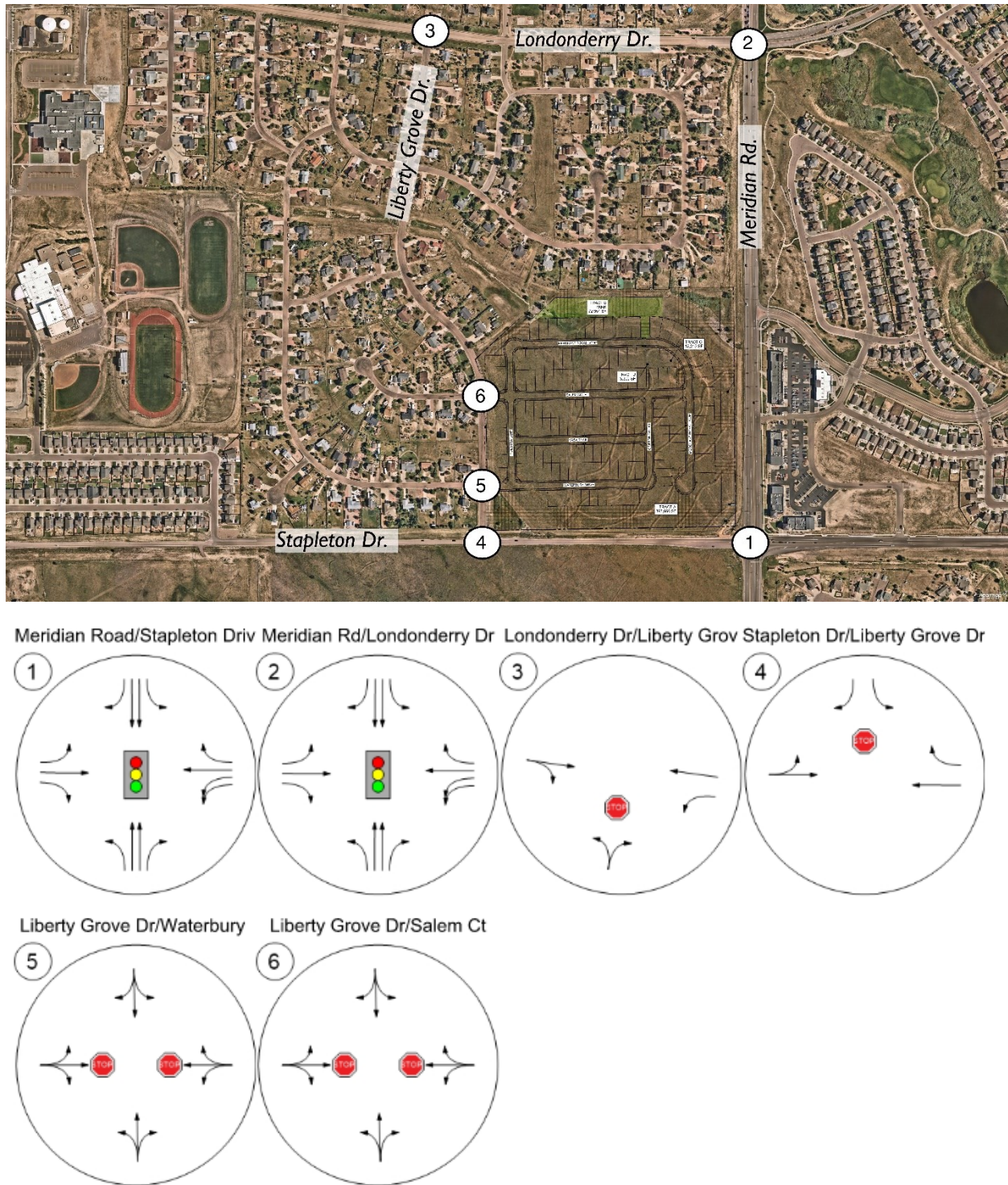


Figure 18. Buildout (2028) With Project Intersection Configurations

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.

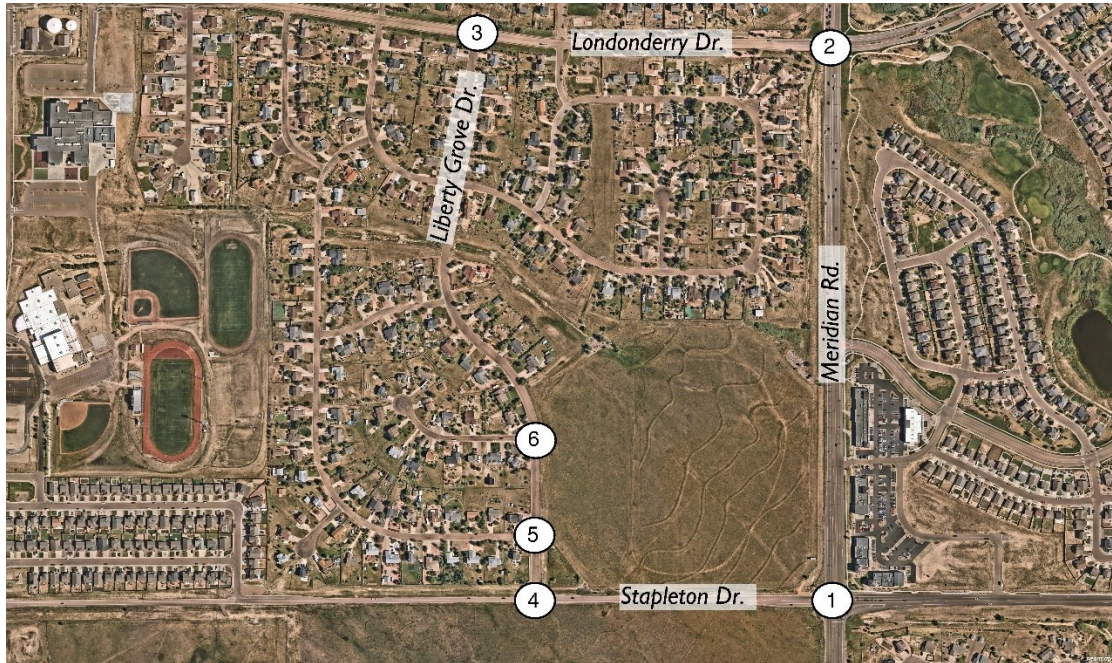
Liberty Grove Drive/Stapleton Drive (#4)

- 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.

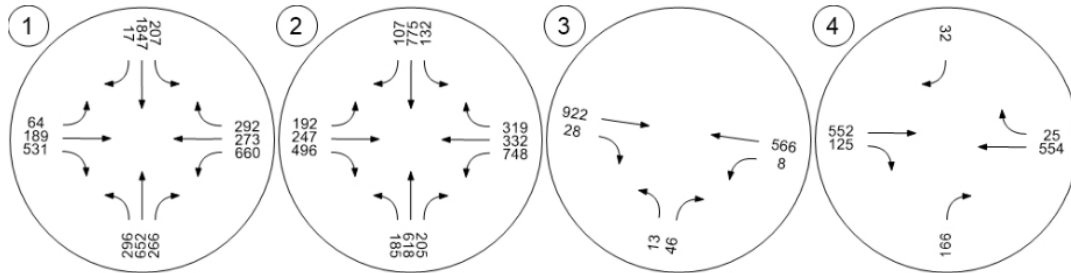
Horizon (2045) No Project Conditions

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

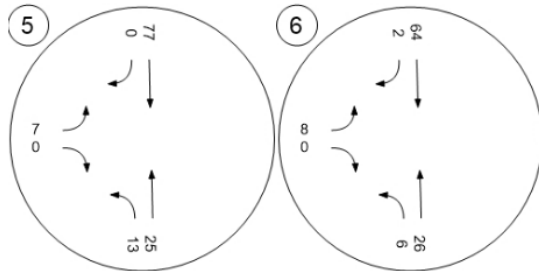
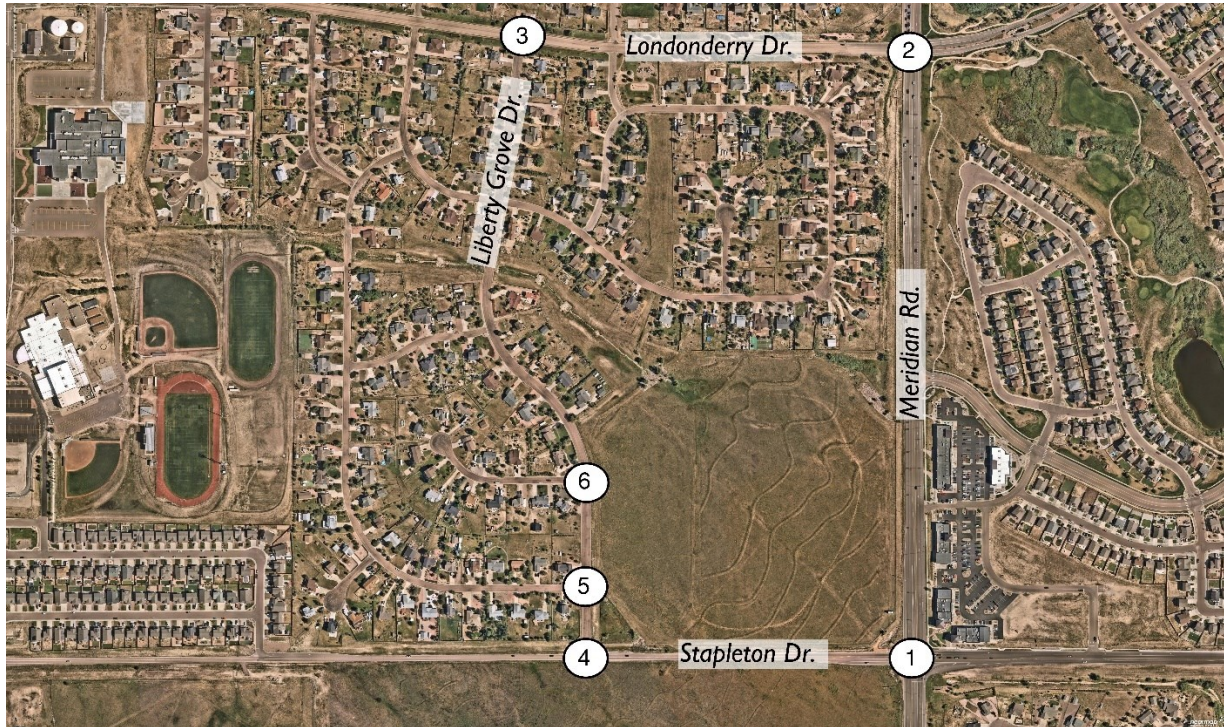
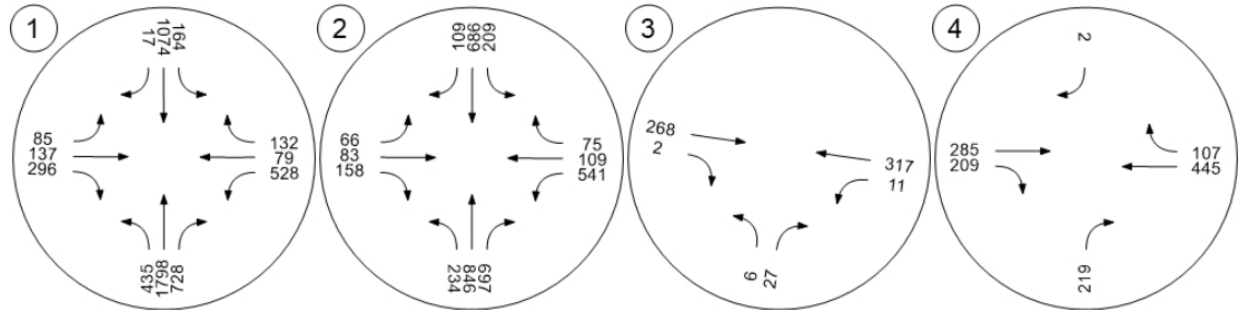


Figure 20. Horizon (2045) No Project Traffic Volumes (PM Peak Hour)



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

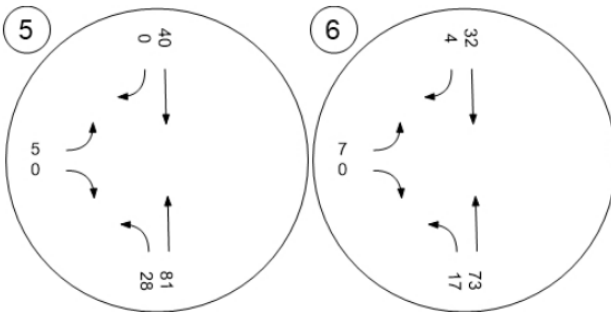
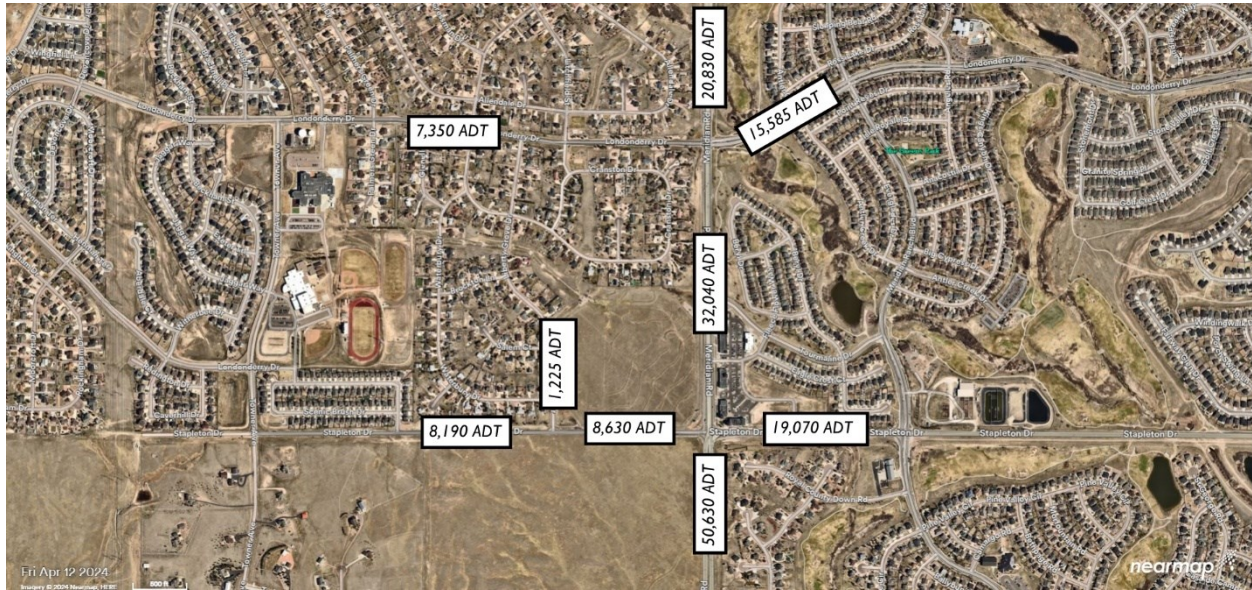


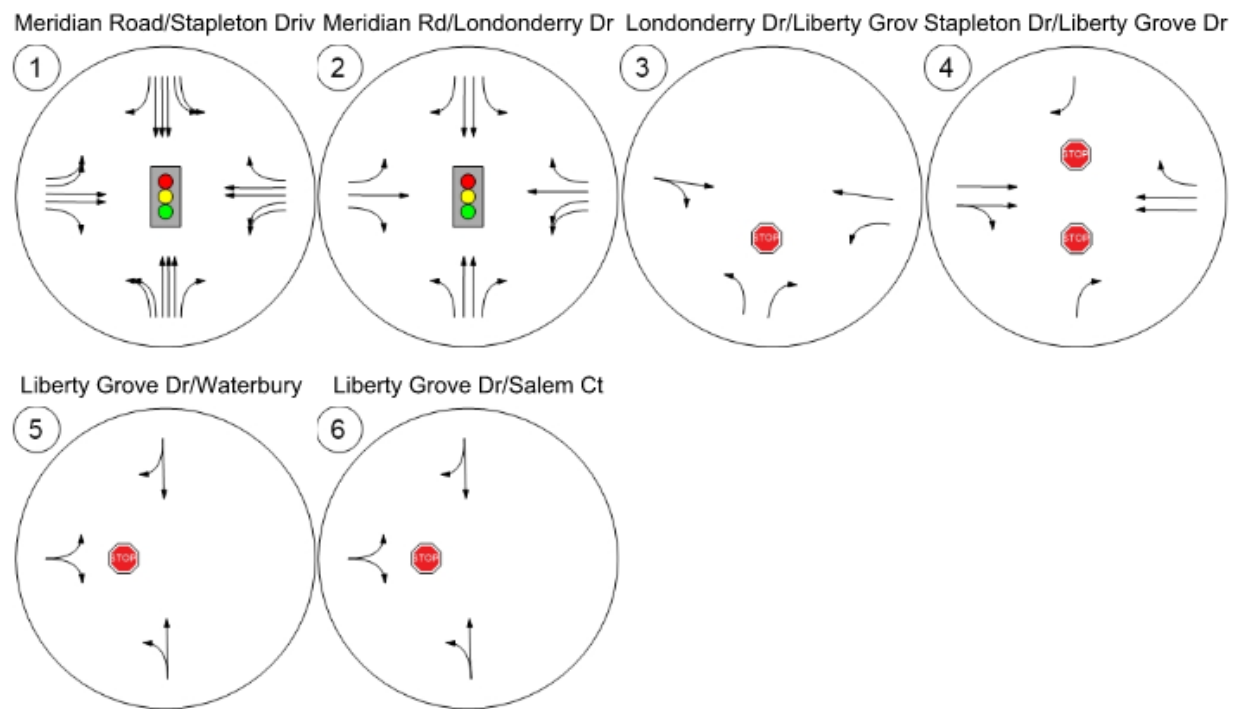
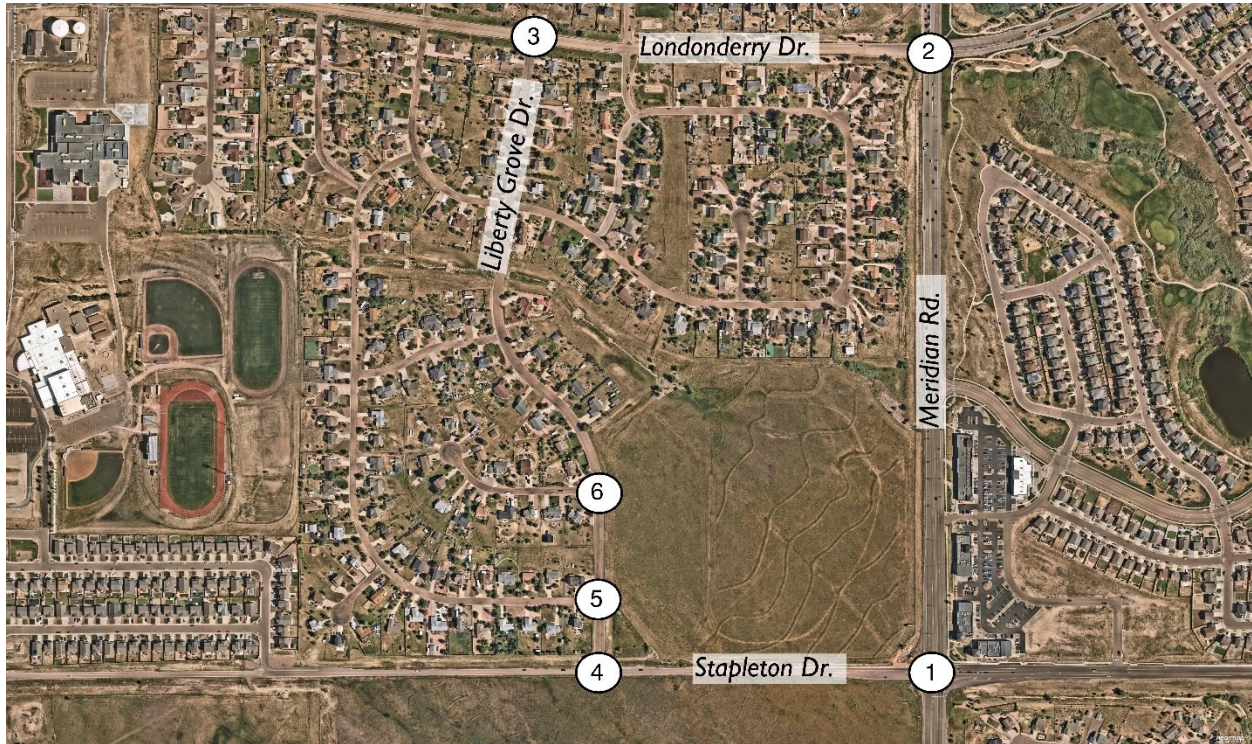
Figure 21. Horizon (2045) No Project Daily Traffic Volumes



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

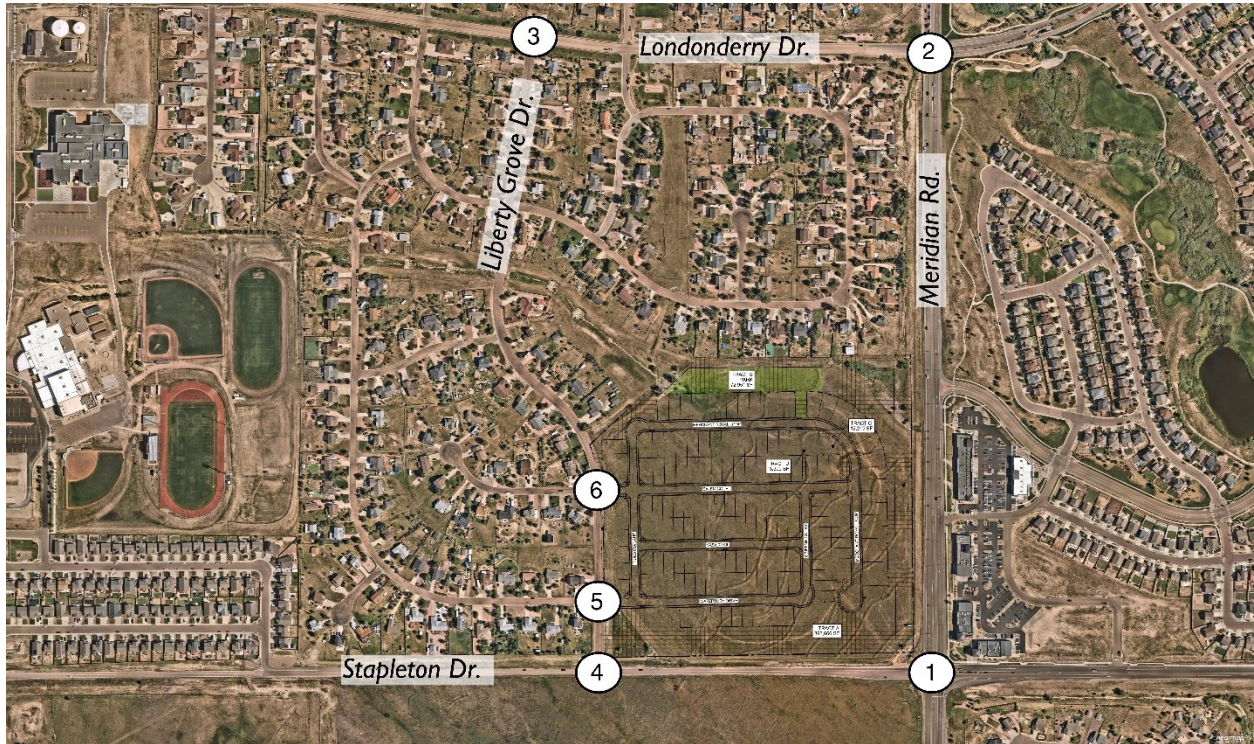
The long-term project's trip distribution for 2045 is shown in Figure 23. The trip distribution for the horizon year was adjusted to reflect the improvements on Stapleton Drive. The long term site trips for both the AM and PM peak hours are shown in Figure 24 and Figure 25. The long term daily trips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

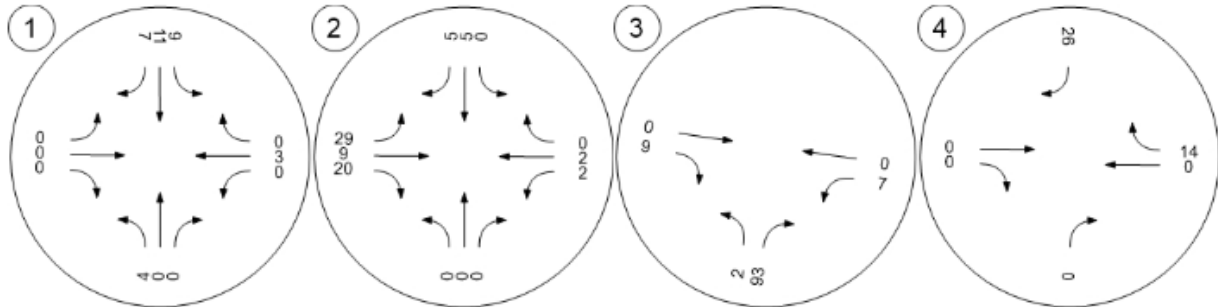
Figure 23. Long-Term Trip Distribution



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

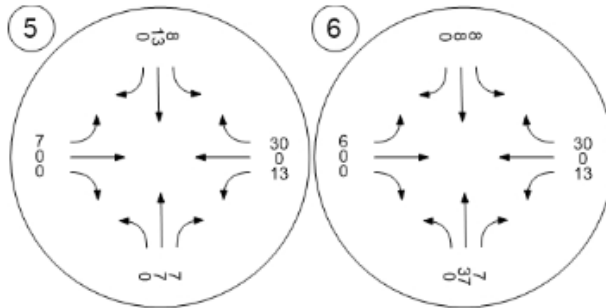
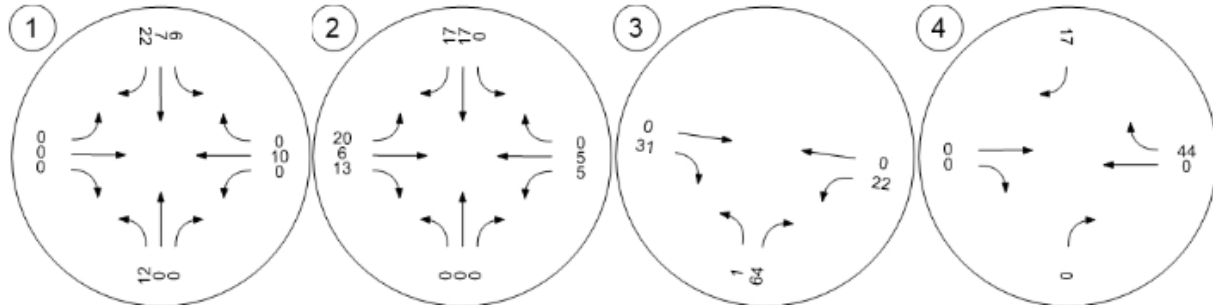


Figure 25. Falcon Reserve Project Trips Long Term (PM Peak Hour)



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

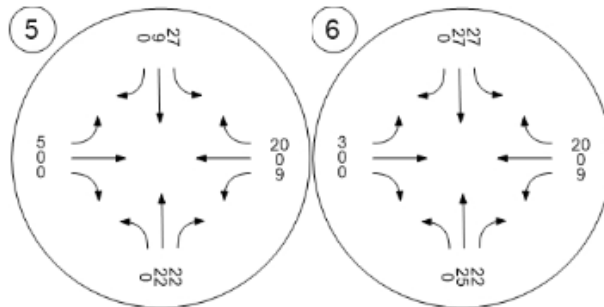
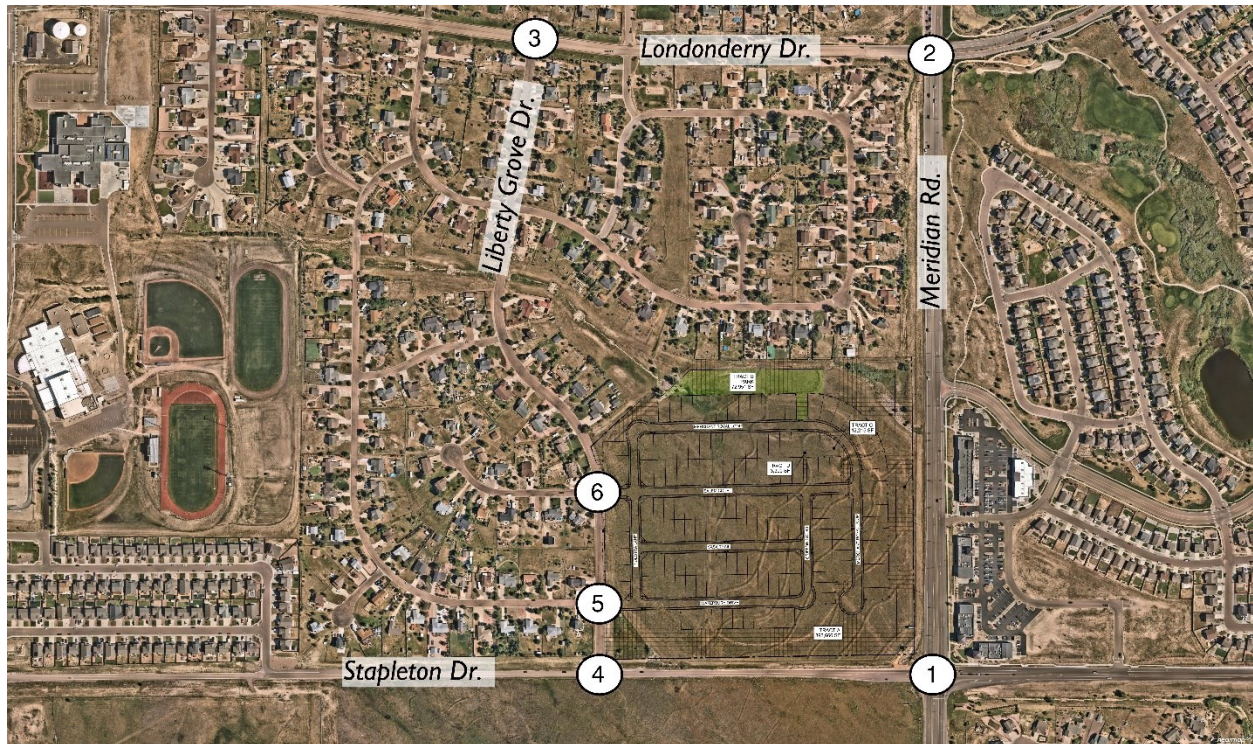


Figure 26. Falcon Reserve Daily Trips (Long Term)

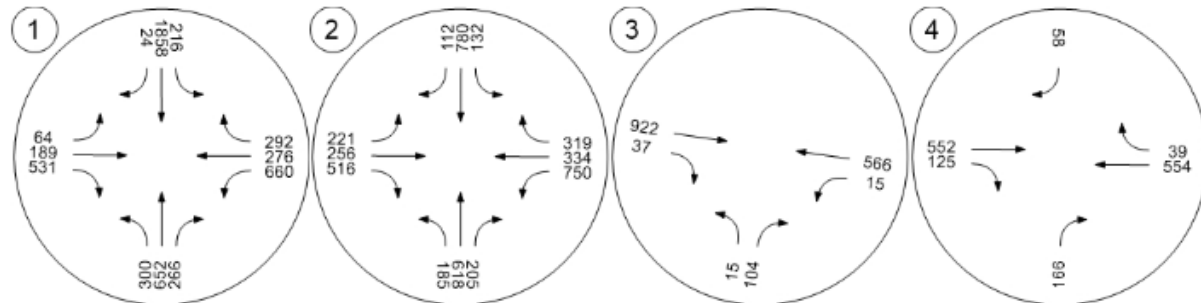


The AM, PM and daily traffic volumes in the horizon year with the addition of the project are as shown in Figure 27, Figure 28, and Figure 29, respectively.

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

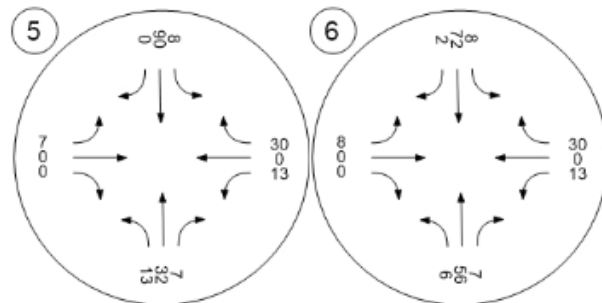
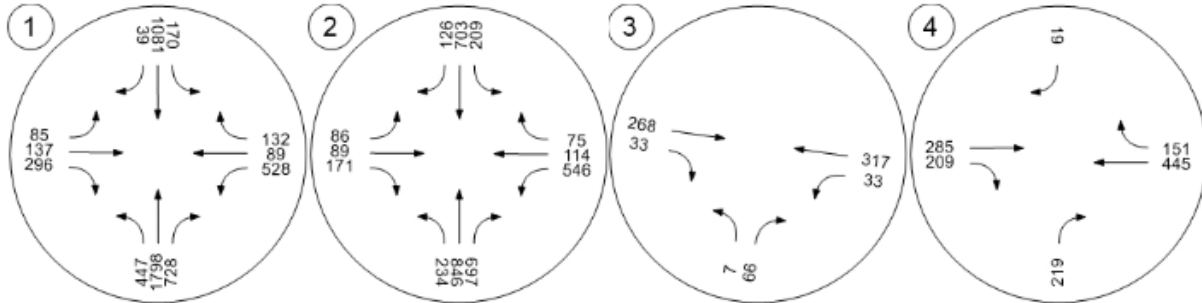


Figure 28. Horizon (2045) With Project Traffic Volumes (PM Peak Hour)



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

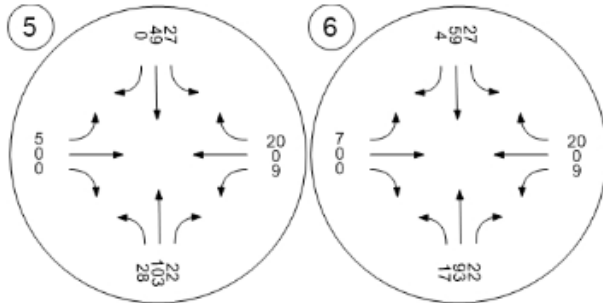
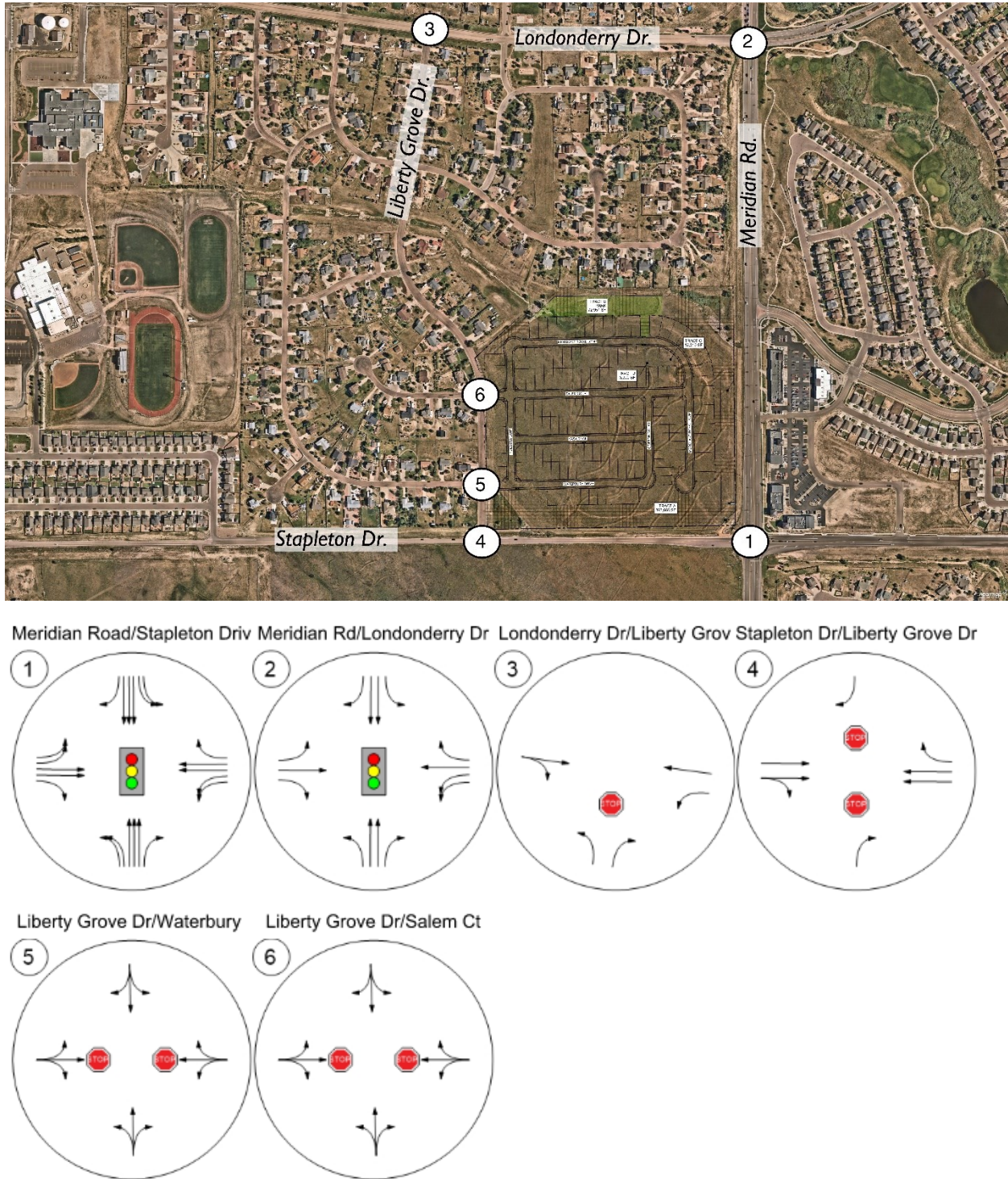


Figure 29. Horizon (2045) With Project Daily Traffic Volumes



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. 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. 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



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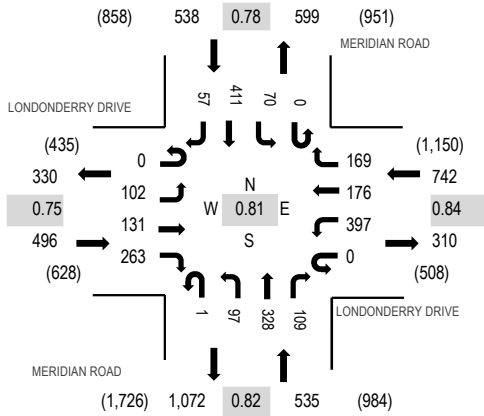
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Date: Tuesday, April 2, 2024

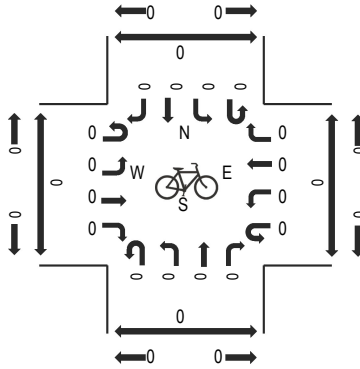
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Peak 15-Minutes: 07:30 AM - 07:45 AM

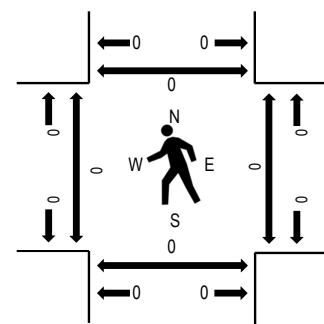
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LONDONDERRY DRIVE				LONDONDERRY DRIVE				MERIDIAN ROAD				MERIDIAN ROAD				Total	Rolling 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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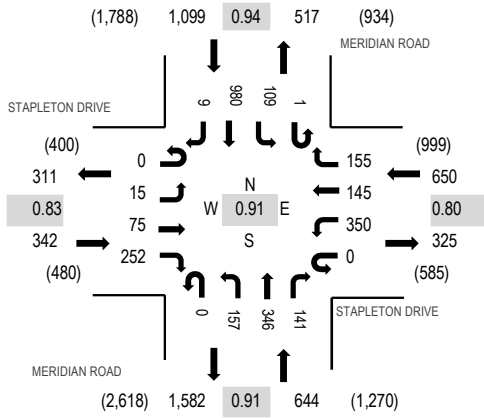
Location: 2 MERIDIAN ROAD & STAPLETON DRIVE AM

Date: Tuesday, April 2, 2024

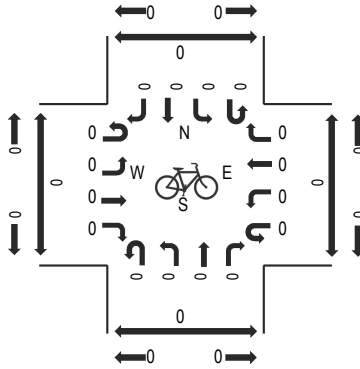
Peak Hour: 07:00 AM - 08:00 AM

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

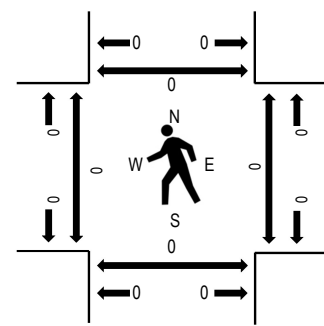
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	STAPLETON DRIVE Eastbound				STAPLETON DRIVE Westbound				MERIDIAN ROAD Northbound				MERIDIAN ROAD Southbound				Total	Rolling 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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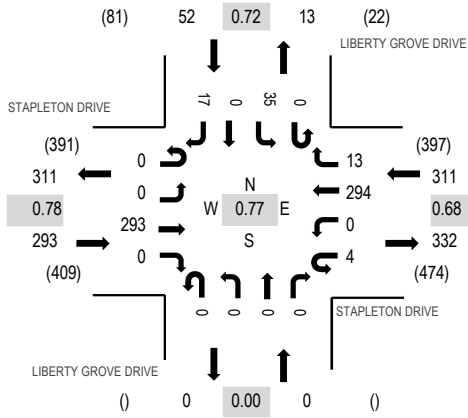
Location: 3 LIBERTY GROVE DRIVE & STAPLETON DRIVE AM

Date: Tuesday, April 2, 2024

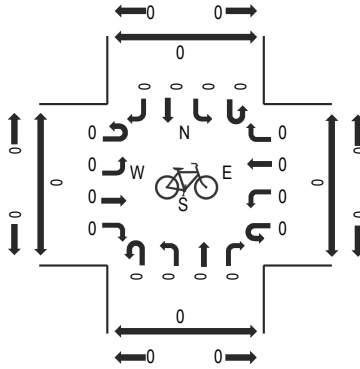
Peak Hour: 07:00 AM - 08:00 AM

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

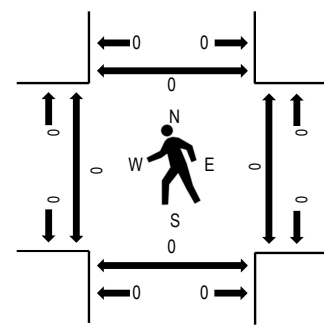
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	STAPLETON DRIVE				STAPLETON DRIVE				LIBERTY GROVE DRIVE				LIBERTY GROVE DRIVE				Total	Rolling 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	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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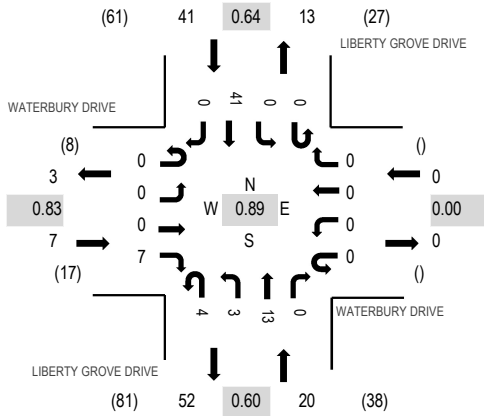
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Date: Tuesday, April 2, 2024

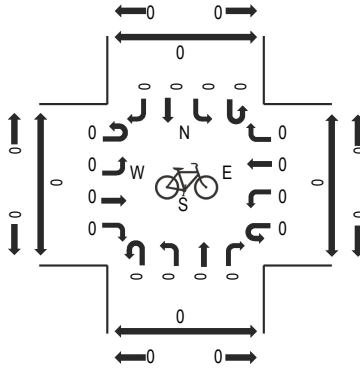
Peak Hour: 07:00 AM - 08:00 AM

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

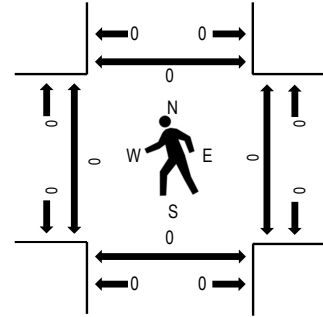
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WATERBURY DRIVE				WATERBURY DRIVE				LIBERTY GROVE DRIVE				LIBERTY GROVE DRIVE				Total	Rolling 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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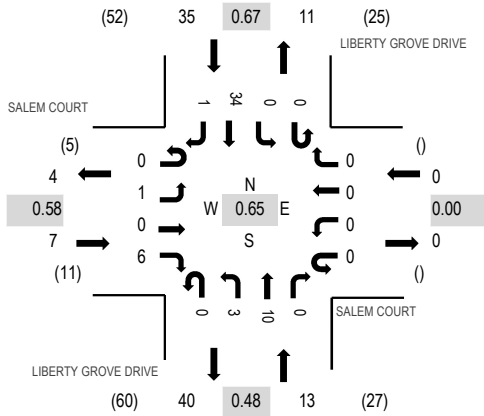
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Date: Tuesday, April 2, 2024

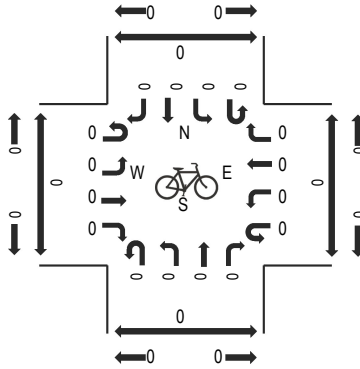
Peak Hour: 07:00 AM - 08:00 AM

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

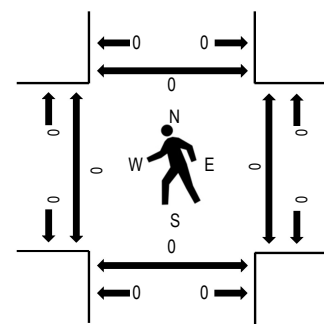
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SALEM COURT Eastbound				SALEM COURT Westbound				LIBERTY GROVE DRIVE Northbound				LIBERTY GROVE DRIVE Southbound				Total	Rolling 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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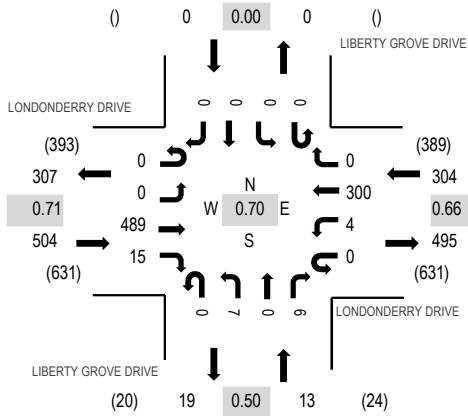
Location: 6 LIBERTY GROVE DRIVE & LONDONDERRY DRIVE AM

Date: Tuesday, April 2, 2024

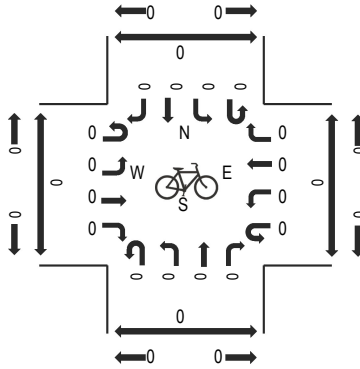
Peak Hour: 07:00 AM - 08:00 AM

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

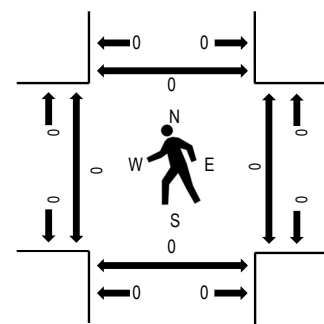
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LONDONDERRY DRIVE Eastbound				LONDONDERRY DRIVE Westbound				LIBERTY GROVE DRIVE Northbound				LIBERTY GROVE DRIVE Southbound				Total	Rolling 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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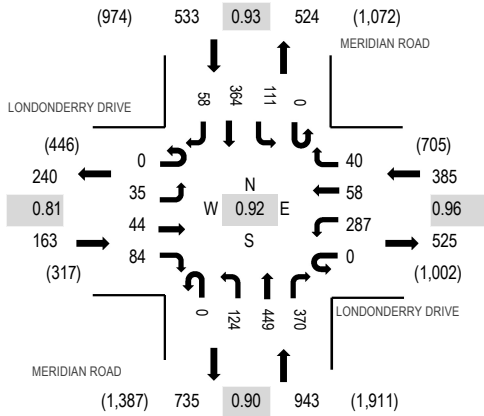
Location: 1 MERIDIAN ROAD & LONDONDERRY DRIVE PM

Date: Tuesday, April 2, 2024

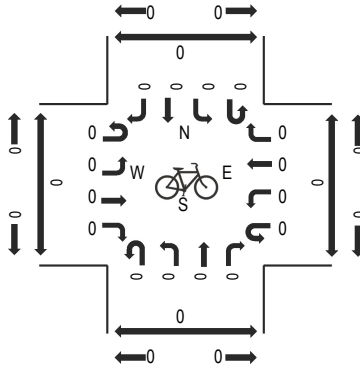
Peak Hour: 04:30 PM - 05:30 PM

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

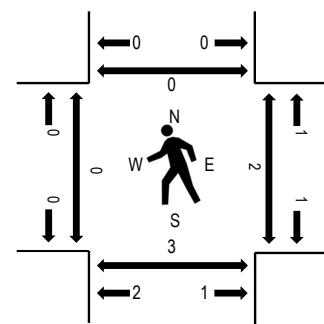
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LONDONDERRY DRIVE Eastbound				LONDONDERRY DRIVE Westbound				MERIDIAN ROAD Northbound				MERIDIAN ROAD Southbound				Total	Rolling 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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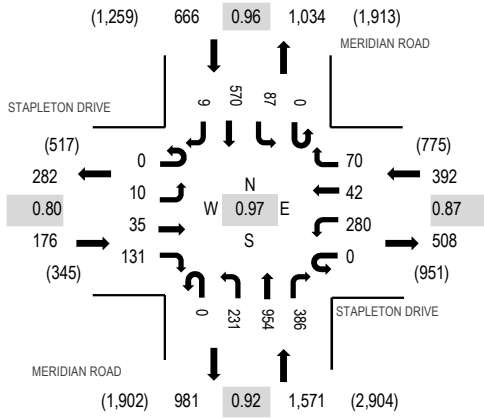
Location: 2 MERIDIAN ROAD & STAPLETON DRIVE PM

Date: Tuesday, April 2, 2024

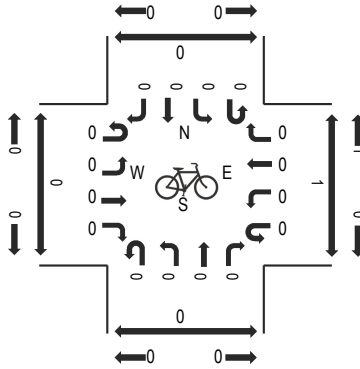
Peak Hour: 04:45 PM - 05:45 PM

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

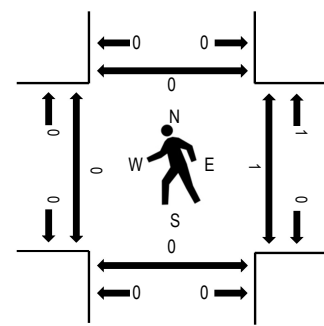
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	STAPLETON DRIVE Eastbound				STAPLETON DRIVE Westbound				MERIDIAN ROAD Northbound				MERIDIAN ROAD Southbound				Total	Rolling 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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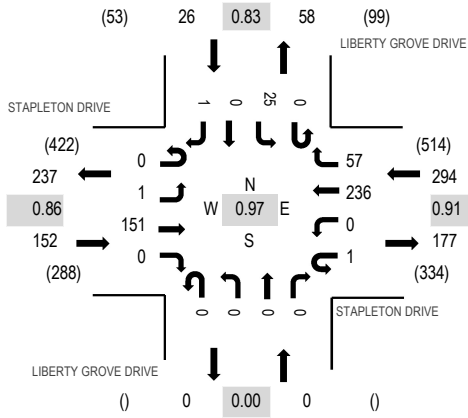
Location: 3 LIBERTY GROVE DRIVE & STAPLETON DRIVE PM

Date: Tuesday, April 2, 2024

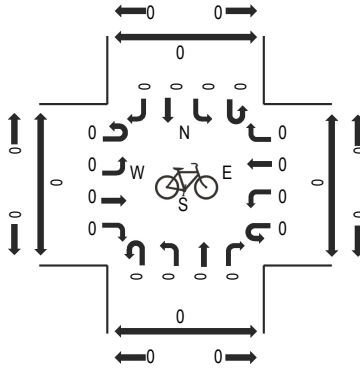
Peak Hour: 04:30 PM - 05:30 PM

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

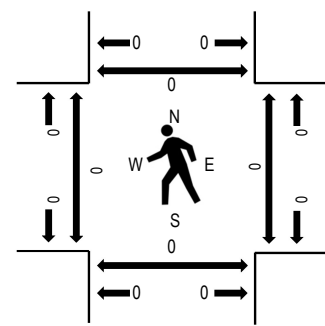
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	STAPLETON DRIVE				STAPLETON DRIVE				LIBERTY GROVE DRIVE				LIBERTY GROVE DRIVE				Total	Rolling 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						
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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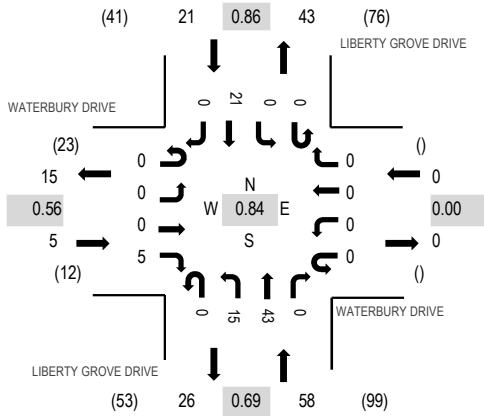
Location: 4 LIBERTY GROVE DRIVE & WATERBURY DRIVE PM

Date: Tuesday, April 2, 2024

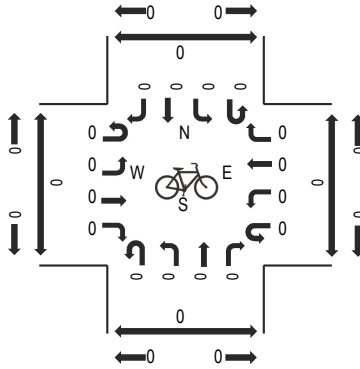
Peak Hour: 04:30 PM - 05:30 PM

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

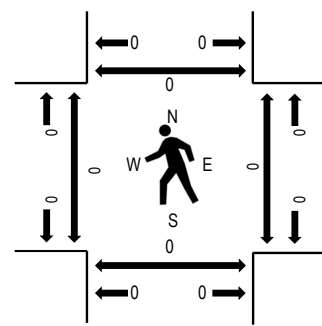
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WATERBURY DRIVE Eastbound				WATERBURY DRIVE Westbound				LIBERTY GROVE DRIVE Northbound				LIBERTY GROVE DRIVE Southbound				Total	Rolling 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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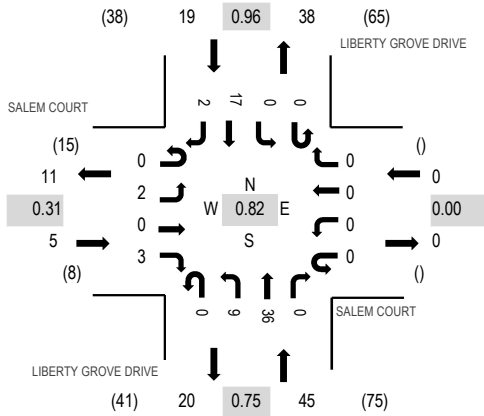
Location: 5 LIBERTY GROVE DRIVE & SALEM COURT PM

Date: Tuesday, April 2, 2024

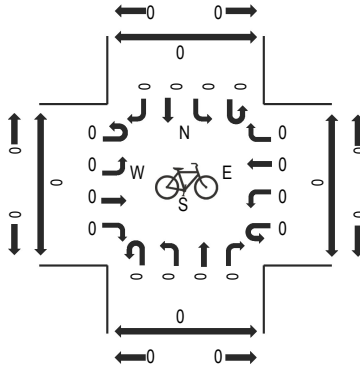
Peak Hour: 04:45 PM - 05:45 PM

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

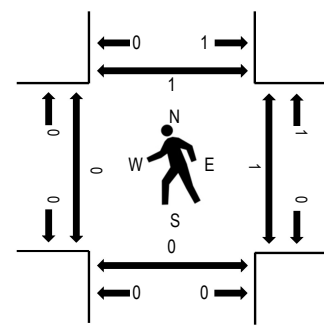
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	SALEM COURT Eastbound				SALEM COURT Westbound				LIBERTY GROVE DRIVE Northbound				LIBERTY GROVE DRIVE Southbound				Total	Rolling 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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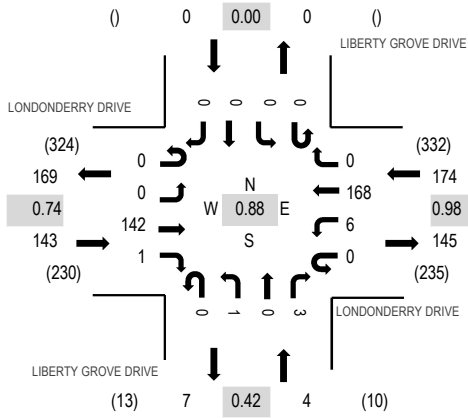
Location: 6 LIBERTY GROVE DRIVE & LONDONDERRY DRIVE PM

Date: Tuesday, April 2, 2024

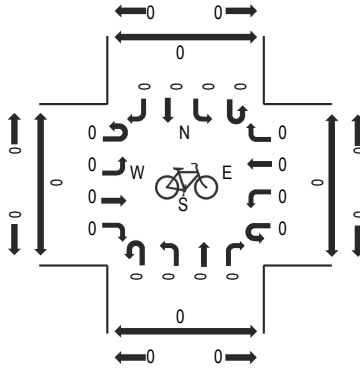
Peak Hour: 04:45 PM - 05:45 PM

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

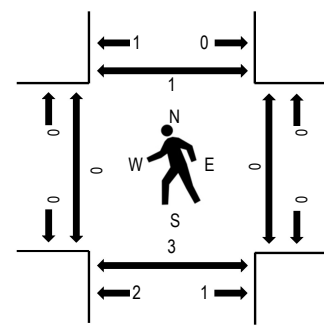
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	LONDONDERRY DRIVE				LONDONDERRY DRIVE				LIBERTY GROVE DRIVE				LIBERTY GROVE DRIVE				Total	Rolling 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						
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 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 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							

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

Start Time	02-Apr-24 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							

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

Start Time	02-Apr-24 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							

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

Start Time	02-Apr-24 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	-
Vol.	-	682	1582	-
PM Peak	-	17:00	15:00	-
Vol.	-	1495	1058	-
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 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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

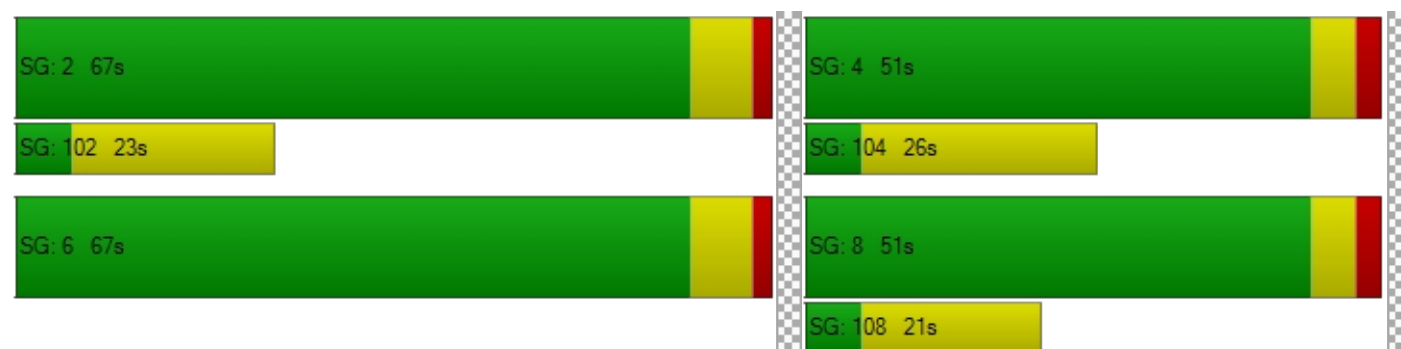
Vehicle Miles Traveled [mph]	39.44	131.48	21.69	22.33	130.77	8.93	44.59	57.38	57.38	72.14	32.03	15.25
Stops [stops/h]	72.17	170.54	26.76	48.33	234.41	14.30	98.38	102.19	104.33	786.42	125.27	56.54
Fuel consumption [US gal/h]	3.30	8.90	1.43	2.05	10.57	0.67	3.41	3.85	3.88	26.72	3.26	1.50
CO [g/h]	230.38	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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 & 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 & 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	530	3500	4500	4400	4870	4500	3670	4870	4500

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s, saturation flow rate [veh/min]	559	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 & 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
l1, 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 & 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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

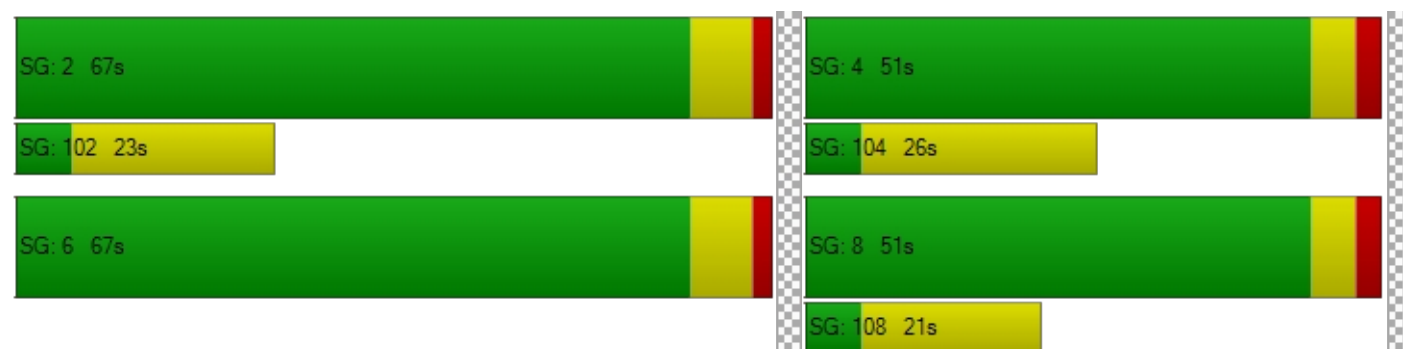
Vehicle Miles Traveled [mph]	45.36	164.02	67.71	29.53	97.02	7.69	14.10	17.71	17.05	45.60	9.15	3.20
Stops [stops/h]	58.98	153.69	65.39	55.98	116.20	8.68	28.72	34.82	33.75	258.21	38.83	13.35
Fuel consumption [US gal/h]	3.01	9.31	3.89	2.41	6.13	0.47	1.01	1.24	1.20	6.06	0.98	0.34
CO [g/h]	210.47	650.81	271.64	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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 & 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 & 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 & 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 & 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	7104	3500	4500	4217	4270	4500	3860	4270	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

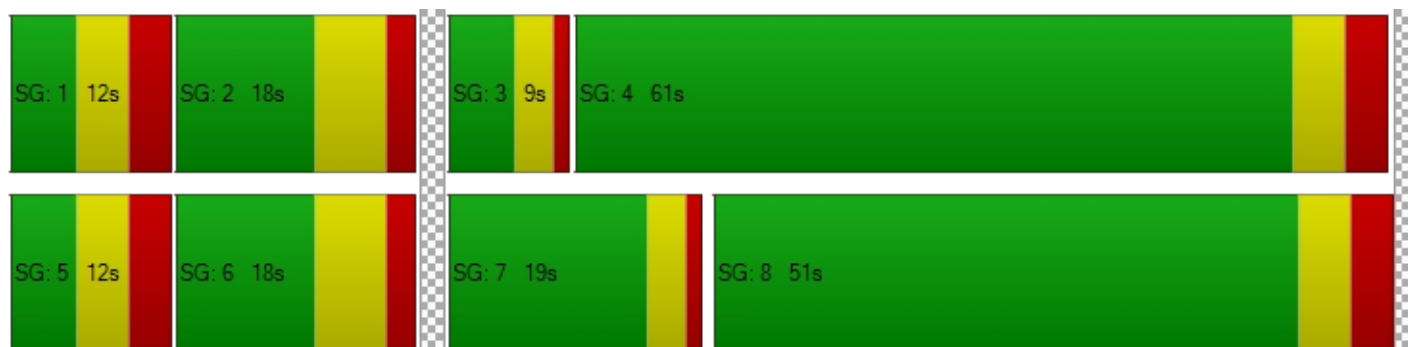
Vehicle Miles Traveled [mph]	85.03	187.65	38.02	14.25	126.91	0.59	1.97	9.84	16.43	97.10	40.30	21.30
Stops [stops/h]	105.59	239.77	46.38	56.92	1015.45	2.81	11.38	81.12	153.61	417.62	134.65	68.17
Fuel consumption [US gal/h]	6.08	12.62	2.49	1.93	32.30	0.09	0.31	2.18	4.16	13.02	4.28	2.19
CO [g/h]	425.14	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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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

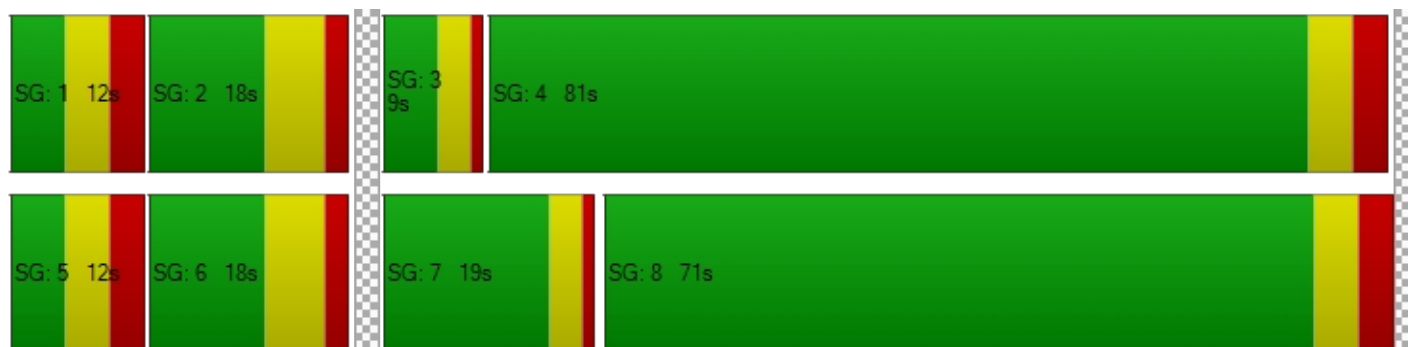
Vehicle Miles Traveled [mph]	125.51	517.57	104.25	11.23	73.80	0.59	1.28	4.53	8.56	77.68	11.48	9.61
Stops [stops/h]	108.13	693.01	109.05	37.04	335.15	2.15	8.68	39.57	80.59	341.84	40.38	33.84
Fuel consumption [US gal/h]	7.18	35.71	6.34	1.46	11.27	0.08	0.24	1.14	2.34	11.27	1.35	1.13
CO [g/h]	501.63	2495.83	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

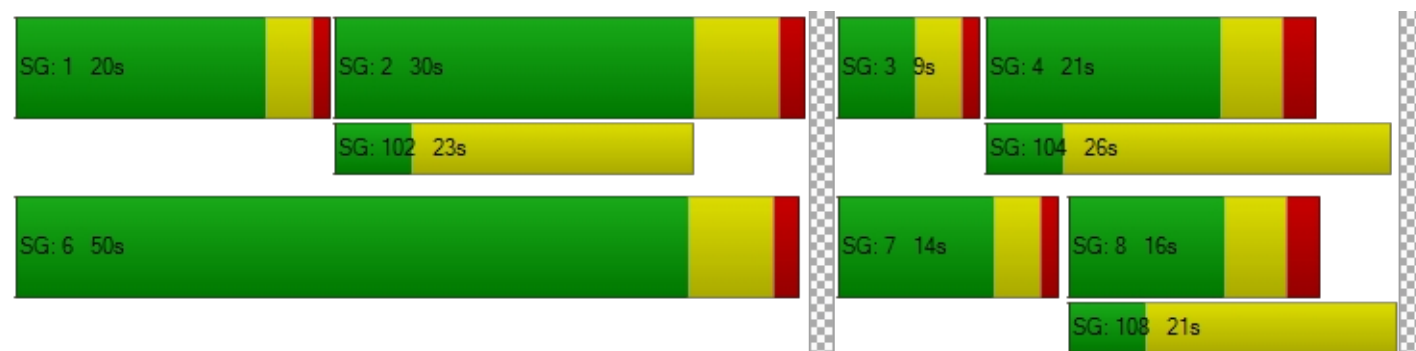
Vehicle Miles Traveled [mph]	54.23	195.57	80.53	36.48	120.10	9.43	15.08	19.34	18.03	58.11	11.59	3.97
Stops [stops/h]	145.78	204.05	87.53	134.44	257.29	18.52	27.40	47.20	44.51	347.15	53.54	17.88
Fuel consumption [US gal/h]	5.91	11.57	4.84	4.83	10.62	0.78	0.98	1.49	1.40	7.96	1.26	0.42
CO [g/h]	413.06	809.04	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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		Eastbound	
Lane Configuration				
Turning Movement	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00
Speed [mph]	30.00		25.00	
Grade [%]	0.00		0.00	
Crosswalk	Yes		Yes	

Volumes

Name	Liberty Grove Dr		Salem Ct	
Base Volume Input [veh/h]	9	36	2	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00
Growth Factor	1.1280	1.1280	1.1280	1.1280
In-Process Volume [veh/h]	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0
Other Volume [veh/h]	0	0	0	0
Total Hourly Volume [veh/h]	10	41	2	3
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	12	1	1
Total Analysis Volume [veh/h]	12	48	2	4
Pedestrian Volume [ped/h]	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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

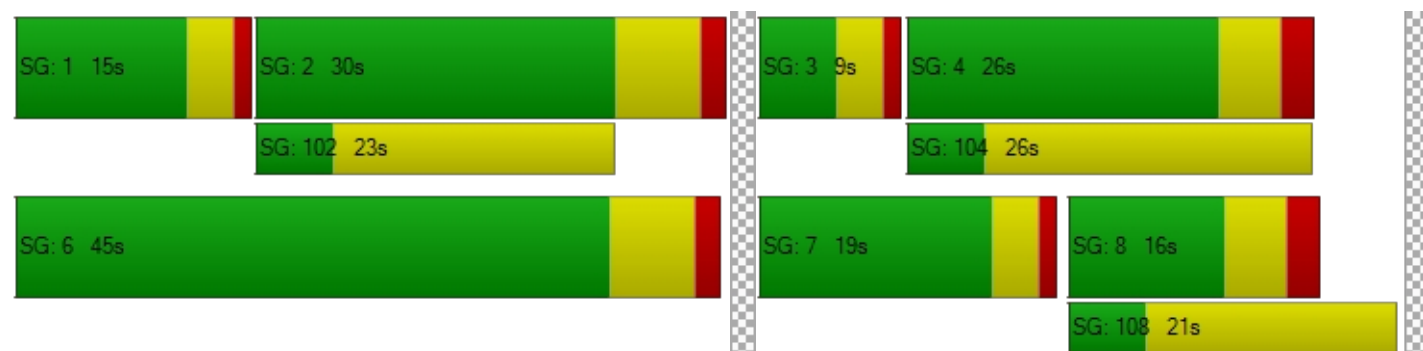
Vehicle Miles Traveled [mph]	43.06	148.90	24.65	23.08	136.97	9.93	50.17	59.02	57.05	80.68	35.99	17.08
Stops [stops/h]	118.37	184.70	29.23	71.88	335.34	21.68	95.16	157.90	164.14	455.88	170.91	75.92
Fuel consumption [US gal/h]	4.78	9.59	1.55	2.67	13.31	0.88	3.27	4.81	4.91	10.36	3.95	1.79
CO [g/h]	334.27	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 ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No	

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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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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

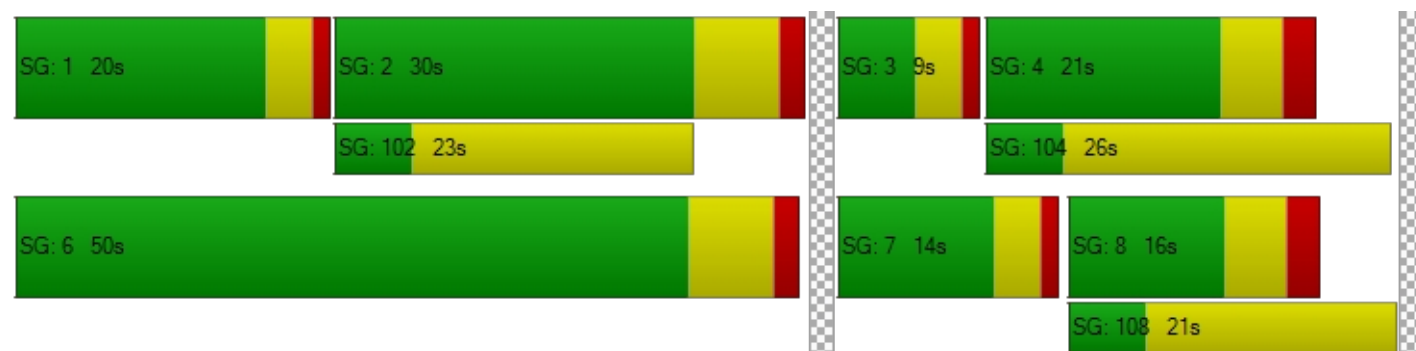
Vehicle Miles Traveled [mph]	54.23	199.51	81.19	36.48	125.06	11.91	19.02	20.33	18.03	59.02	12.51	3.97
Stops [stops/h]	145.78	209.54	88.59	136.38	270.29	23.60	34.77	49.66	44.46	356.62	58.41	18.01
Fuel consumption [US gal/h]	5.91	11.84	4.89	4.89	11.12	0.99	1.23	1.57	1.39	8.18	1.37	0.43
CO [g/h]	413.06	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 ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /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: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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No	

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

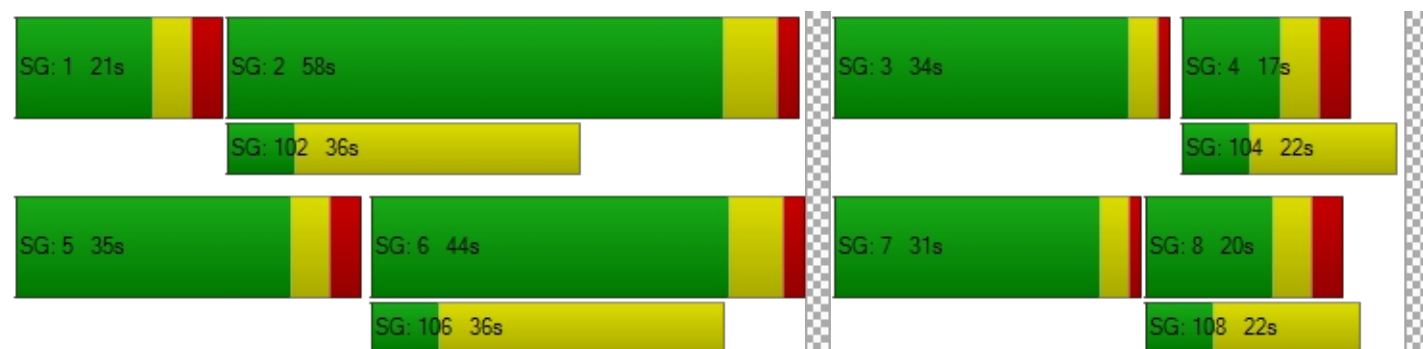
Vehicle Miles Traveled [mph]	42.00	92.35	21.28	189.77	0.78	6.59	19.58	145.12	59.93
Stops [stops/h]	286.01	363.58	197.48	1621.16	3.98	62.45	181.43	656.85	205.10
Fuel consumption [US gal/h]	10.74	13.21	7.17	53.90	0.14	1.89	5.45	21.73	6.95
CO [g/h]	751.06	923.54	501.29	3767.77	9.55	131.94	380.88	1519.23	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 ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /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

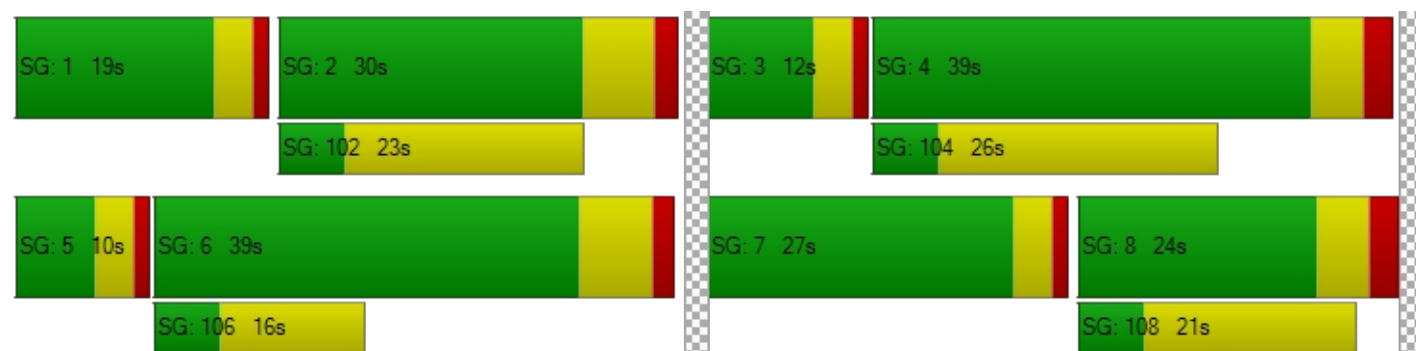
Vehicle Miles Traveled [mph]	64.09	213.98	35.17	34.49	202.48	13.90	66.23	85.25	85.58	120.03	53.23	25.47
Stops [stops/h]	196.19	450.16	66.19	75.78	772.85	37.94	113.76	226.54	252.69	770.24	244.47	105.94
Fuel consumption [US gal/h]	8.12	19.54	2.97	3.19	29.65	1.51	4.27	7.22	7.89	18.52	5.89	2.63
CO [g/h]	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 12.7
 Level Of Service: B
 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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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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
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /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	3.661	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

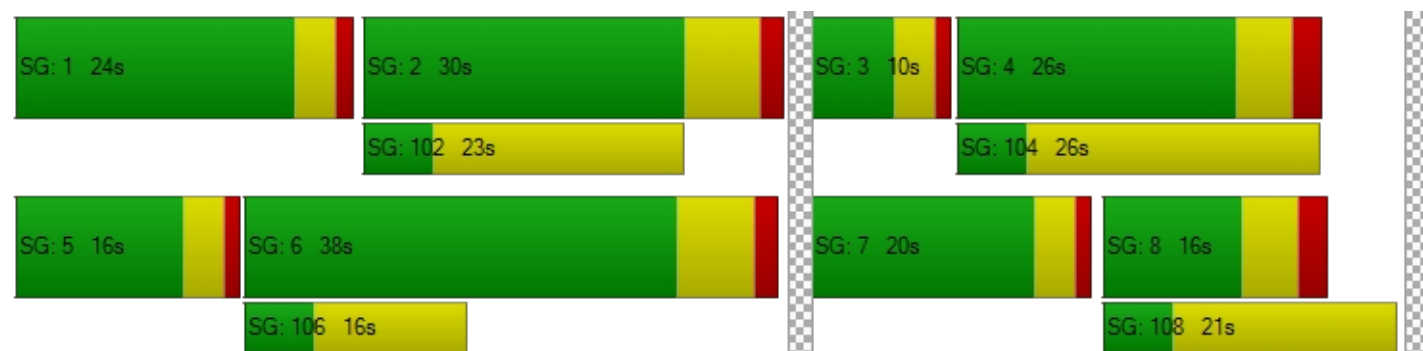
Vehicle Miles Traveled [mph]	80.86	292.86	120.30	54.59	179.15	14.14	22.62	28.53	27.21	86.78	17.54	5.95
Stops [stops/h]	227.48	572.54	243.37	101.63	505.16	33.26	40.10	73.07	70.98	520.07	79.19	25.85
Fuel consumption [US gal/h]	9.30	24.95	10.49	4.63	19.62	1.35	1.46	2.32	2.24	12.20	1.92	0.63
CO [g/h]	650.22	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
Analysis Method: HCM 7th Edition
Analysis Period: 15 minutes

Delay (sec / veh): 9.6
Level Of Service: A
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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No

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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

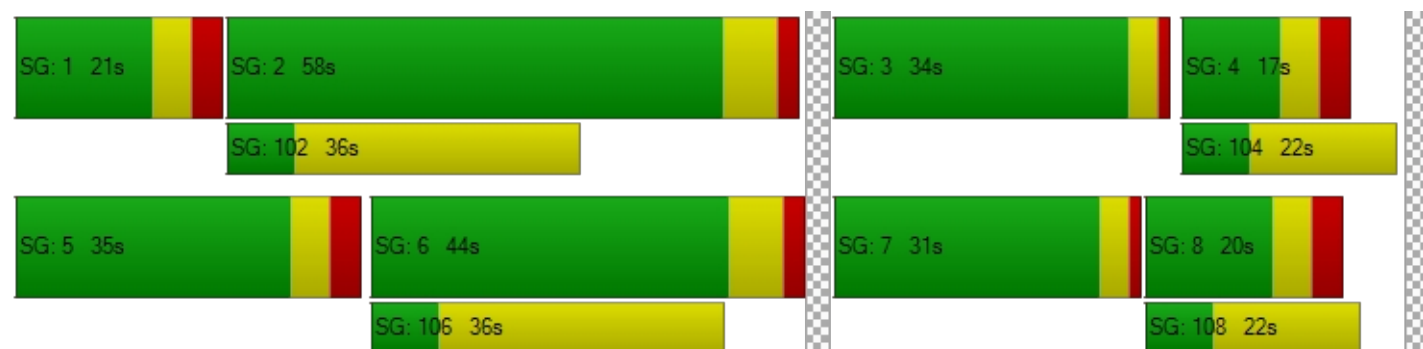
Vehicle Miles Traveled [mph]	129.19	280.45	22.16	190.94	1.27	6.59	19.58	145.12	60.76
Stops [stops/h]	289.77	365.78	205.46	1649.96	6.51	62.45	181.43	656.85	208.22
Fuel consumption [US gal/h]	13.78	19.58	7.46	54.96	0.22	1.89	5.45	21.73	7.05
CO [g/h]	963.40	1368.50	521.21	3841.53	15.59	131.94	380.88	1519.23	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 ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /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

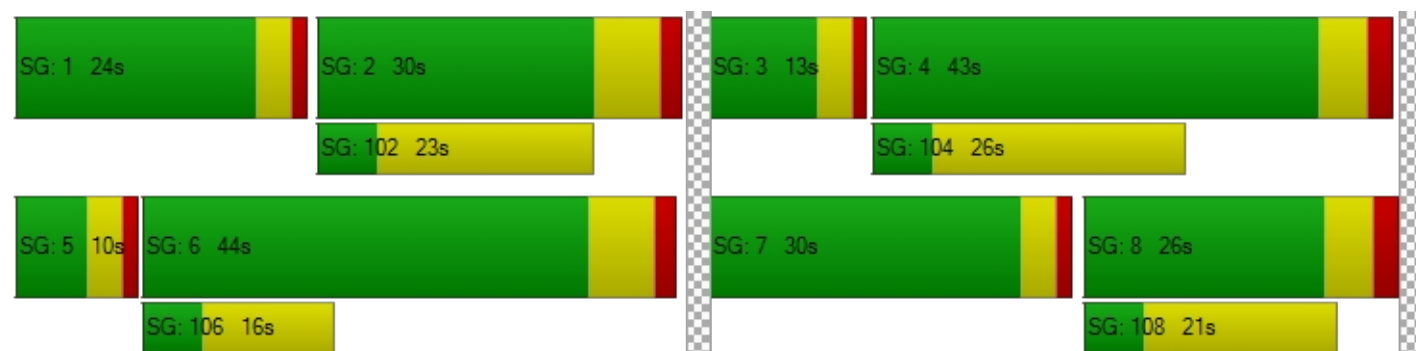
Vehicle Miles Traveled [mph]	64.09	213.98	35.17	34.49	203.72	14.64	76.40	88.20	89.18	120.33	53.68	25.47
Stops [stops/h]	186.16	443.19	65.12	76.13	742.31	39.75	135.94	237.91	272.03	739.94	248.10	106.45
Fuel consumption [US gal/h]	7.92	19.55	2.97	3.24	28.99	1.61	5.11	7.73	8.68	18.19	6.11	2.70
CO [g/h]	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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No	

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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

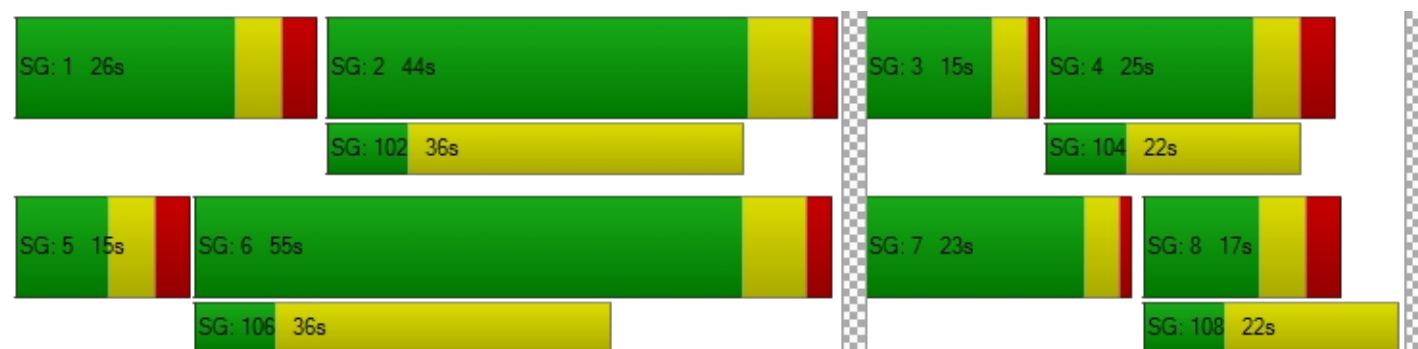
Vehicle Miles Traveled [mph]	192.56	773.90	17.47	111.09	1.95	8.76	14.17	116.10	19.63
Stops [stops/h]	412.34	1388.32	161.12	787.19	11.10	81.55	121.97	509.44	64.61
Fuel consumption [US gal/h]	18.91	64.05	5.58	25.66	0.37	2.31	3.42	16.19	2.14
CO [g/h]	1322.13	4477.05	390.02	1793.85	25.69	161.52	239.23	1131.92	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 ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /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 ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /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
Warrant Met for Intersection	No

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
Warrant Met for Intersection	No	

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
Warrant Met for Intersection	No	

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

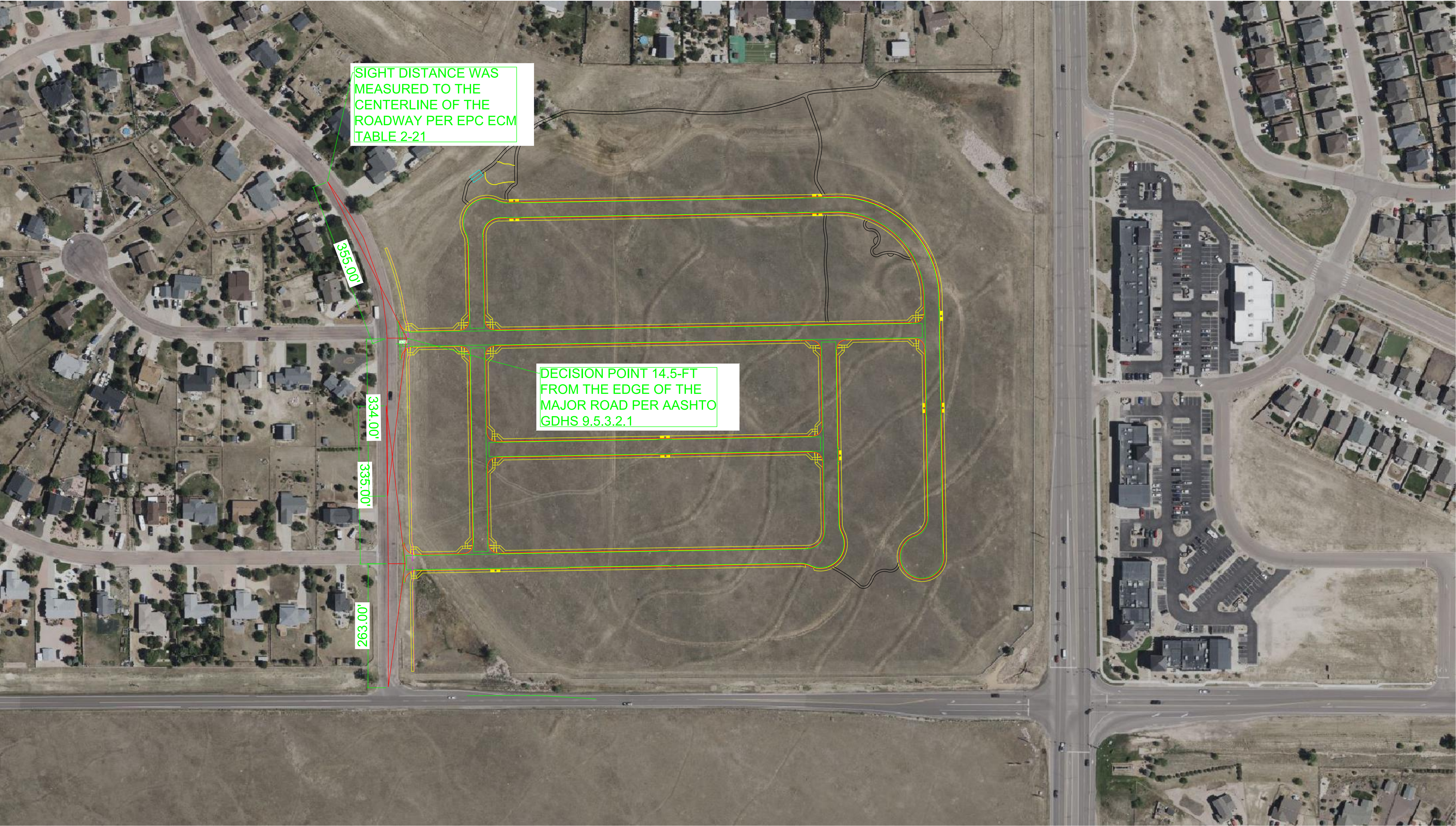
Warrant Analysis by Hour

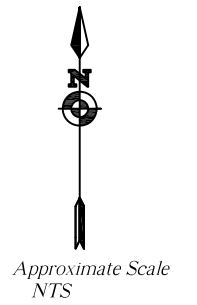
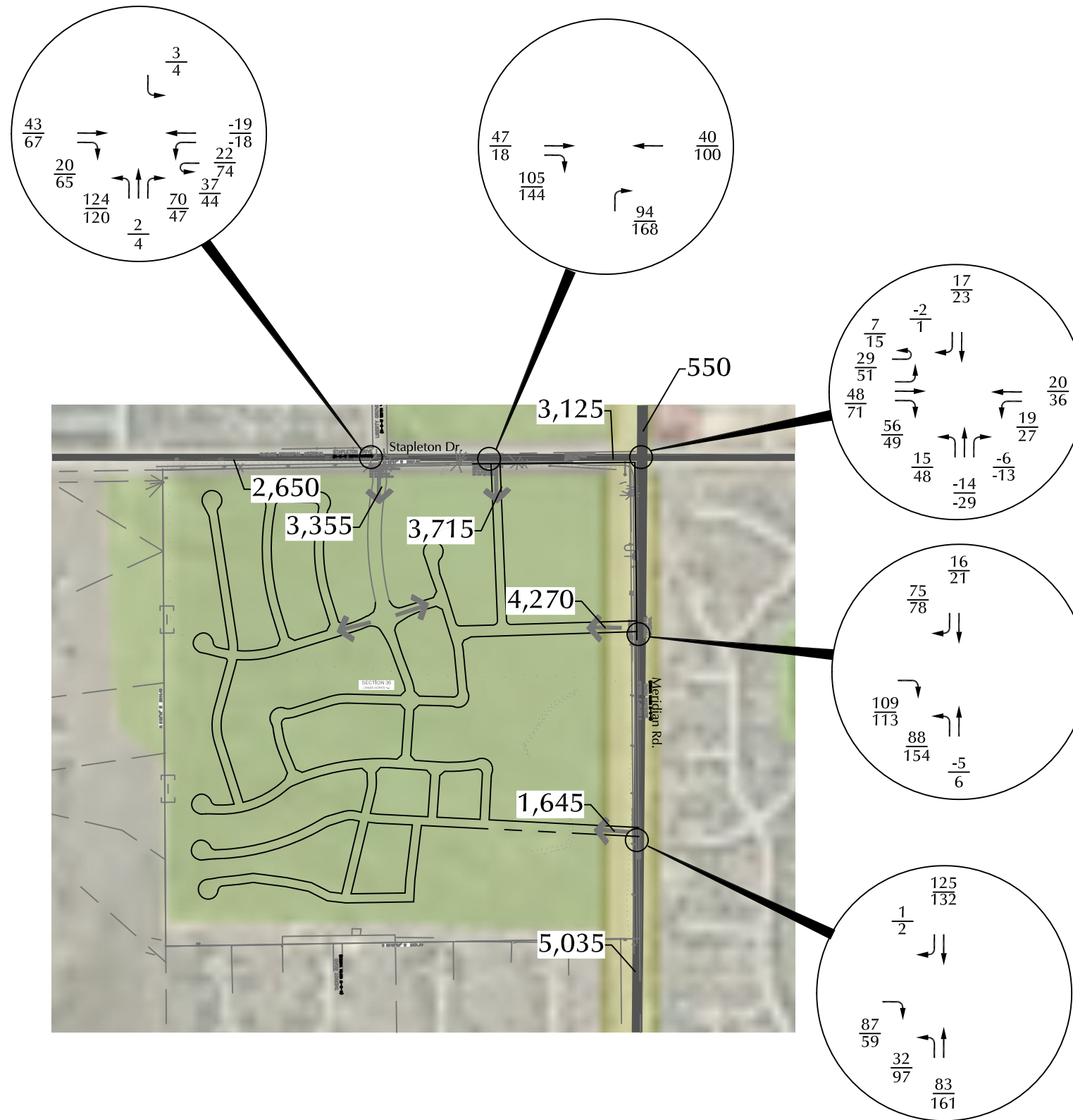
Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	222	1	29	No	No	No	No	No	No	No	No	No	No
2	1	215	1	28	No	No	No	No	No	No	No	No	No	No
3	1	211	1	28	No	No	No	No	No	No	No	No	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

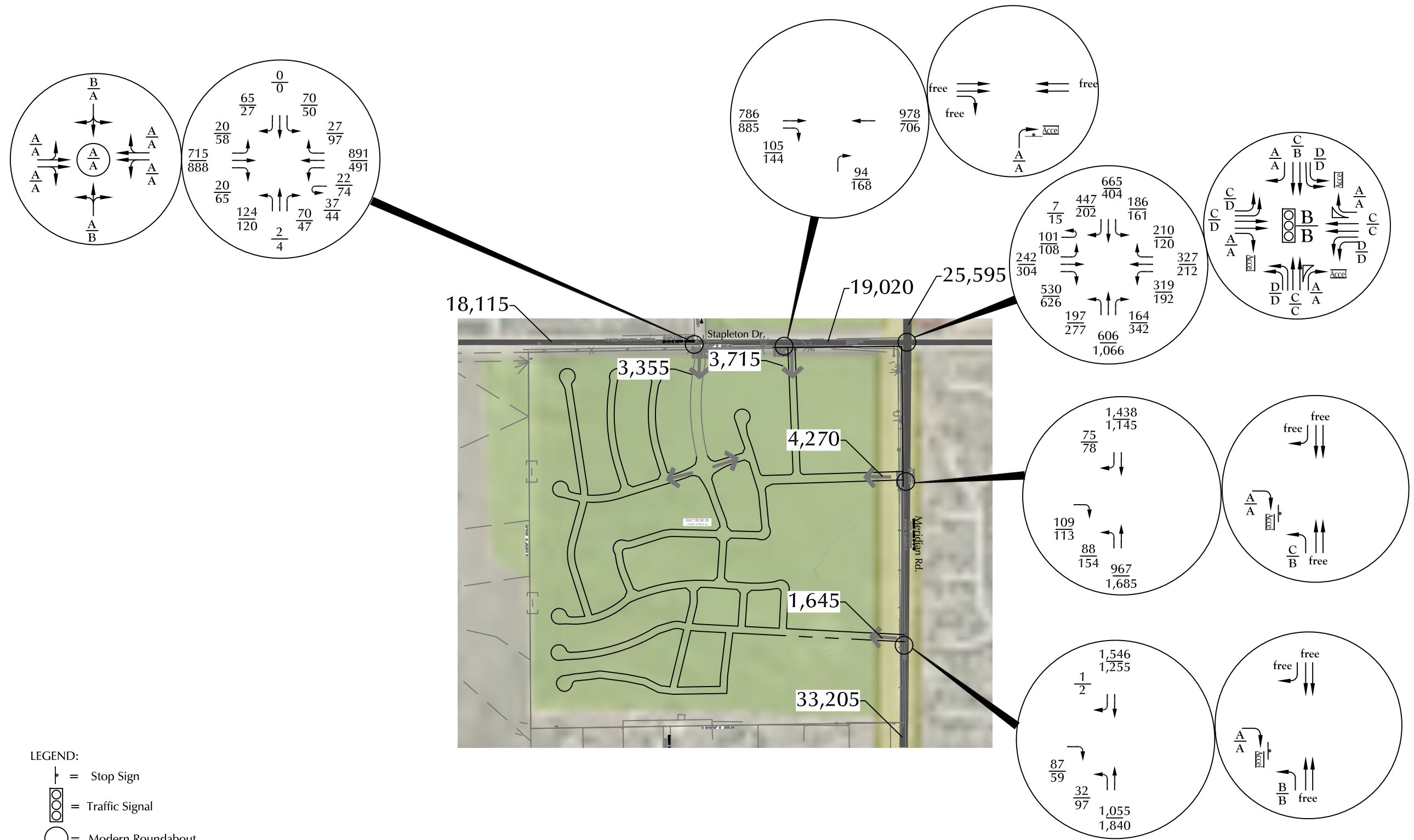
Warrant 3 Condition A

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
Warrant Met for Intersection	No	

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)

