Shady View Residential Project

Addendum 2 to the Final Environmental Impact Report

SCH NO. 2021060576

LEAD AGENCY:

City of Chino Hills
Community Development Department
14000 City Center Drive
Chino Hills, CA 91709

October 2024

INTRODUCTION AND PURPOSE

This document is the second addendum to the Shady View Residential Project Final Environmental Impact Report (SCH No. 2021060576), dated August 2022 (EIR). The EIR was adopted and certified by the City of Chino Hills in September 2022. This addendum serves as the environmental review for a proposed modification to the implementation timing of intersection improvements at the intersection of Shady View Drive/State Route 71 Off-Ramp at Butterfield Ranch Road and at the intersection of Twin Knolls Drive and Butterfield Ranch Road. This addendum has been prepared pursuant to the provisions of the California Environmental Quality Act (CEQA), Public Resources Code Sections 21000 et seq. and the State CEQA Guidelines.

BASIS FOR AN ADDENDUM

Pursuant to Section 15164 of the CEQA Guidelines, an addendum to a certified EIR may be prepared, "if some changes or additions are necessary but none of the conditions described in Section 15162 calling for the preparation of a subsequent or supplemental EIR have occurred." As set forth in CEQA Guidelines Sections 15162 and 15163, a subsequent EIR or supplemental EIR, respectively, shall be prepared if the lead agency determines that one or more of the following conditions has occurred:

1) Substantial changes in the project are proposed which require major revisions to the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

2) Substantial changes occur with respect to the circumstances under which the project is undertaken which require major revisions to the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time of EIR certification, shows any of the following:

    A. The project will have one or more significant effects not discussed in the EIR and will result in impacts substantially more severe than those disclosed in the EIR.

    B. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measure or alternative;

    C. Significant effects previously examined will be substantially more severe than shown in the previous EIR;

    D. Mitigation measures or alternatives that are considerably different from those analyzed in the EIR would substantially reduce one or more significant effects on the environment, but the project proponent declines to adopt the mitigation measure or alternative.

Section 15164 of the CEQA Guidelines provides that an addendum "need not be circulated for public review," but shall be considered by the local agency prior to rendering a decision on the project.

In accordance with the CEQA Guidelines, the City has reviewed the proposed modifications to the approved project and has determined that an addendum to the certified EIR is the appropriate environmental document for considering those proposed modifications. As further detailed in this addendum, no substantial changes are proposed to the approved project that would require major revisions to the EIR, no mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and no new information of substantial importance relative to the project has been identified since the certification of the project EIR.

PROJECT DESCRIPTION

APPROVED PROJECT

The Shady View Residential Project consists of Tentative Tract Map No. 20317 and Tract Home Design Review No. 474 to develop a single-family residential subdivision consisting of 159 homes on an approximately 130-acre property located at the southern termini of Shady View Drive and Via La Cresta. Conditional Use Permit No. 19CUP06, for which Optima Conservation Resources Exploration, LLC, was a joint applicant, was approved for the demolition of an existing oil storage tank facility that serves oil wells on nearby properties and the construction of a replacement facility in the northwestern area of the property. The subdivision will consist of 159 single-family residential homes, a community recreation center, private interior streets, debris basins, private utility infrastructure, and other associated improvements. Additionally, the project includes approximately 80.8 acres of homeowners' association-maintained open space. Residential lot sizes within the proposed subdivision range from 7,200 square feet to 14,273 square feet, with an average lot size of approximately 8,808 square feet and a median lot size of approximately 8,243 square feet. The 159 single-family homes will range in size from 2,381 square feet to 3,888 square feet and provide between three and six bedrooms, and three to four-and-a-half bathrooms. Of the 159 single family homes, 56 will be single-story, including 14 homes that are primarily single-story with a loft and one bedroom on a second floor. Each home will be provided with a two- or three-car garage and a driveway providing at least two additional onsite parking spaces.

Conditions of Approval Nos. 186 through 189 require the implementation of traffic control improvements at the intersections of Shady View Drive/State Route 71 Off-Ramp and Butterfield Ranch Road and Twin Knolls Drive and Butterfield Ranch Road prior to the occupancy of any dwelling unit within the project. The improvements at the intersection of Shady View Drive/State Route 71 Off-Ramp and Butterfield Ranch Road include the restriping of the of the eastbound approach to include an exclusive right-turn pocket and modification to the traffic signal equipment. A new traffic signal, and associated improvements, will be installed at the intersection of Twin Knolls Drive and Butterfield Ranch Road. These are collectively referred to herein as the "Traffic Control Improvements."

PROPOSED PROJECT

This section discusses the proposed modifications to the Approved Project.

The Approved Project required the Traffic Control Improvements to be completed prior to the issuance of the first certificate of occupancy for a dwelling unit in the Project. The proposed modification consists of deferring completion of the Traffic Control Improvements until prior to the issuance of the 45th certificate of occupancy for a dwelling unit within the Project. No other changes or modifications to the approved project are proposed.

ENVIRONMENTAL ANALYSIS

As approved, the project is conditioned to implement the Traffic Control Improvements at the specified intersections prior to the occupancy approval of any dwelling unit within the project. The proposed modification would allow the deferral of the Traffic Control Improvements implementation until prior to the occupancy approval of the 45th dwelling unit of the project. The nature of the project and the Traffic Control Improvements will remain the same as evaluated in the certified EIR. Only the timing of the implementation would be affected by the proposed modification, which would allow up to 44 dwelling units to be occupied prior to the implementation of the Traffic Control Improvements at the intersections. Linscott, Law & Greenspan Engineers prepared the attached Traffic Impact Phasing Assessment (dated October 7, 2024) to evaluate the potential impact of deferring the Traffic Control Improvements as discussed herein. This analysis determined that the occupancy of 45 dwelling units will not have a significant impact on the intersections within the study area, including the intersections that are subject to the required Traffic Control Improvements. Therefore, the proposed modification will not cause a potentially significant impact.

CONCLUSION

The deferral of the implementation of the Traffic Control Improvements as proposed in the project modification do not constitute a substantial change in the project description as evaluated in the EIR certified for the Shady View Residential Project. As discussed in the Environmental Analysis section of this addendum, the deferral of the Traffic Control Improvements will not cause a new significant environmental effect nor result in a substantial increase in the severity of the project's previously identified significant effects. There have been no significant changes to the environmental setting or the circumstances under which the project is being undertaken. No new information of substantial importance relative to the project has been identified since the certification of the project EIR. Having thus determined that the preparation of a subsequent EIR or supplemental EIR is not required as none of the conditions specified in Section 15162 of the CEQA Guidelines have occurred, the City of Chino Hills finds that this addendum to the certified EIR is the appropriate environmental document for considering the proposed modifications to the approved project.

Attachment A:
Traffic Impact Phasing Assessment
Prepared by: Linscott, Law & Greenspan Engineers
Dated: October 7, 2024

Attachment A

2 Executive Circle
Suite 250
Irvine, CA 92614
949.825.6175 T
949.825.5939 F
www.llgengineers.com

Pasadena
Irvine
San Diego

TECHNICAL MEMORANDUM

To: Ryan Gackstetter, Senior Planner
Michael Hofflinger, Planning Manager
City of Chino Hills
Community Development Department

Date: October 7, 2024

cc: Eric A. Nelson, VP – Community Development
Trumark

From: Richard Barretto, P.E., Principal
Linscott, Law & Greenspan, Engineers

LLG Ref: 2.20.4245.2
2.24.4872.1

Subject: ***Traffic Impact Phasing Assessment***
Shady View Residential Development (Tentative Tract Map 20317)
Chino Hills, CA

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit this Traffic Impact Phasing Assessment Technical Memorandum associated with Shady View (Tentative Tract Map 20317), a new 159-unit residential community that is generally located south of Butterfield Ranch Road, south of an existing residential development at the southern terminus of Shady View Drive and Via La Cresta, and west of the SR-71 Freeway in the City of Chino Hills, California.

The focus of this analysis is to evaluate the potential impacts associated with the occupancy of up to 45 residential dwelling units and operation of six (6) model homes which are a part of Phases 1 through 6 of development. The phased assessment would determine traffic generated by 45 units would require the implementation of improvements identified in *Conditions of Approval (COA) 186 – 188 of Tentative Tract Map 20317, Conditional Use Permit 19CUP06, Tract Home Design Review 474, dated September 6, 2022*. From our understanding, modification of *COA 186 – 188,* which read as follows, is being requested to allow for occupancy of the 45 units.

186. Prior to the issuance of the first Certificate of Occupancy for the project, the Applicant/Owner shall implement the improvements to the intersection of Shady View Drive/State Route 71 Off-Ramp at Butterfield Ranch Road as recommended in the project Traffic Study. The improvements generally consist of restriping the eastbound approach to include an exclusive right-turn pocket and modifying the traffic signal to include an overlap phase for the northbound right-turn and protected/permissive phasing for the westbound left-turn. All improvements need to conform to Caltrans standards per the California Manual on Uniform Traffic Control Devices (CA MUTCD). The Applicant/Owner shall submit a signing and striping plan and details on the signal modifications for the City Engineer's approval prior to implementation. The Applicant/Owner shall be responsible for obtaining an encroachment permit from Caltrans for the improvements.

187. Prior to the issuance of the first Certificate of Occupancy for the project, the Applicant/Owner shall install a two-phase traffic signal at the intersection of

Twin Knolls Drive and Butterfield Ranch Road pursuant to the project Traffic Study's analysis. Additional improvements beyond those required for the construction/installation of traffic signal equipment on all four corners may be necessary and will be subject to review and approval of the City Engineer, inclusive of traffic signal phasing. All improvements shall conform to the City of Chino Hills Standard Design Guidelines and/or California Manual on Uniform Traffic Control Devices (CA MUTCD). The Applicant/Owner shall also install video detection as a part of the traffic signal for all legs. The traffic signal and interconnect shall be operational prior to the issuance of the first Certificate of Occupancy for the project.

188. *Prior to the issuance of the first Certificate of Occupancy, pavement striping, marking, traffic signing, street name signing, traffic signal conduit, and interconnect conduit shall be installed to the satisfaction of the City Engineer.*

Traffic Analysis

To assess the potential impact of traffic generated by 45 units of the Shady View residential community, this traffic analysis evaluates the operating conditions at the following six (6) key study intersections as evaluated in the approved *Revised Traffic Study for Shady View Project (Tentative Tract Map 20317), prepared by LLG.* This study is used as a reference and database for phasing assessment.

Key Intersection	Jurisdiction
1. Shady View Drive at Mystic Canyon Drive	Chino Hills
2. Shady View Drive/SR-71 Off-Ramp at Butterfield Ranch Road	Chino Hills/Caltrans
3. Brookwood Lane at Butterfield Ranch Road	Chino Hills
4. Twin Knolls Drive at Butterfield Ranch Road	Chino Hills
5. Mystic Canyon Drive at Butterfield Ranch Road	Chino Hills
6. Butterfield Ranch Road at Pine Avenue	Chino Hills

Table A summarizes the trip generation rates used in forecasting the vehicular trips generated by 45 unit of the proposed Project and presents the forecast peak hour and daily traffic volumes. As shown, 45 units is forecast to generate 425 weekday daily trips (one half arriving, one half departing), with 33 trips (8 inbound, 25 outbound) produced during the AM peak hour and 45 trips (28 inbound, 17 outbound) produced during the PM peak hour. It should be noted that the project trips were distributed according to the distribution pattern provided in the approved traffic study for the Project.

The potential traffic impact of these project trips, with a focus to the intersections of Shady View Drive/SR-71 Off-Ramp at Butterfield Ranch Road (No.2) and Twin Knolls Drive at Butterfield Ranch Road (No. 4) is summarized in ***Table B***.

The structure and format of *Table B* is similar to that of *Table 8-2* as included in the approved traffic study for the Project. As shown, *Table B* summarizes the weekday AM peak hour and PM peak Level of Service results at the six (6) key study intersections for the Year 2024. The second column (2) lists projected cumulative traffic conditions (existing plus ambient plus cumulative projects traffic) based on existing intersection geometry, while the third column (3) column presents forecast Year 2024 cumulative conditions with the addition of traffic generated by 45 units of the Project development. The fourth column (4) of *Table B* indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and impact criteria identified in the approved traffic study. The fifth column (5) indicates the anticipated LOS with planned and/or recommended improvements, if any. It should be noted that the results shown in columns (1) and (2) are unchanged from the approved traffic study and are provided for informational purposes only.

Appendix A presents the presents the ICU/HCM/LOS calculation worksheets for Year 2024 With Project Traffic Conditions (45 DU) for the six (6) key study intersections.

Review of columns (3) and (4) of *Table B* indicates that traffic associated with the proposed Project will not have an impact at any of the key study intersections. With a focus to the intersections of Shady View Drive/SR-71 Off-Ramp at Butterfield Ranch Road (No.2) and Twin Knolls Drive at Butterfield Ranch Road (No. 4), Project-related traffic associated with 45 units is forecast to be insignificant. All six study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of traffic generated by 45 units.

Table C provides the project trips for the six (6) key study intersections for the AM and PM peak hour. As shown in *Table C,* the project trips at the six (6) key study intersections are considered minimal.

As such, based on the result of the analysis, the occupancy of 45 units will not have a significant effect on any of the study intersection. Further, the recommended improvements identified in COA 186 and COA 187 for intersections of Shady View Drive/SR-71 Off-Ramp at Butterfield Ranch Road (No.2) and Twin Knolls Drive at Butterfield Ranch Road (No. 4) will not be required through the first 45 units.

* * * * * * * * * * *

We appreciate the opportunity to provide this Supplemental Analysis. Please let us know if you have any questions regarding this response memorandum.

Attachments

cc: Shane S. Green, P.E., LLG
File

TABLES A, B, AND C
PROJECT TRIP GENERATION, LEVEL OF SERVICE (OPERATIONS) ANALYSIS SUMMARY, AND PROJECT TRIPS AT KEY STUDY INTERSECTIONS

TABLE A
PROJECT TRIP GENERATION RATES AND FORECAST[1]
PHASE 1 THROUGH 6 – 45 DU
SHADY VIEW, CHINO HILLS

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Rates:							
▪ 210: Single-Family Detached Housing (TE/DU)	9.44	25%	75%	0.74	63%	37%	0.99
Project Trip Generation Forecast:							
▪ Single-Family Homes (45 DU)	425	8	25	33	28	17	45

Notes:

- TE/DU = Trip End per Dwelling Unit

[1] Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).

TABLE B
YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS PHASING ASSESSMENT
PHASE 1 THROUGH 6 – 45 DU
SHADY VIEW, CHINO HILLS

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Year 2024 Without Project Traffic Conditions			(3) Year 2024 With Project Traffic Conditions (45 DU)			(4) Significant Impact			(5) Year 2024 With Project With Mitigation		
		Delay (s/v)	V/C	LOS	Delay (s/v)	V/C	LOS	Delay (s/v)	V/C	LOS	Delay Increase	V/C Increase	Yes/ No	Delay (s/v)	V/C	LOS
1. Shady View Drive at Mystic Canyon Drive	AM	7.8	0.151	A	7.6	0.134	A	7.7	0.144	A	0.1	0.010	No	--	--	--
	PM	7.6	0.142	A	7.5	0.120	A	7.6	0.150	A	0.1	0.030	No	--	--	--
2. Shady View Dr/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	42.0	0.731	D	45.5	0.743	D	3.5	0.012	No	--	--	--
	PM	46.1	0.619	D	49.8	0.633	D	51.1	0.655	D	1.3	0.022	No	--	--	--
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.1	0.353	B	15.1	0.354	B	0.0	0.001	No	--	--	--
	PM	11.0	0.326	B	10.7	0.330	B	10.7	0.331	B	0.0	0.001	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	13.9	0.132	B	14.0	0.142	B	0.1	0.010	No	--	--	--
	PM	23.0	0.013	C	25.2	0.014	D	26.2	0.014	D	1.0	0.000	No	--	--	--
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.4	0.157	D	36.5	0.158	D	0.1	0.001	No	--	--	--
	PM	30.4	0.303	C	30.5	0.303	C	30.4	0.305	C	0.0[2]	0.002	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	18.1	0.435	B	18.1	0.435	B	0.0	0.000	No	--	--	--
	PM	33.6	0.600	C	**60.1**	**0.734**	**E**	**60.0**	**0.736**	**E**	0.02	0.002	No	--	--	--

Note:

- **Bold** LOS values indicate adverse service levels based on City LOS standards; s/v = seconds per vehicle (delay).

[2] Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.0 s/v.

TABLE C
PROJECT TRIPS AT KEY AREA INTERSECTIONS
PHASE 1 THROUGH 6 – 45 DU
SHADY VIEW, CHINO HILLS

Key Location	(1) AM Peak Hour Project Trips	(2) PM Peak Hour Project Trips
1. Shady View Drive at Mystic Canyon Drive	27	38
2. Shady View Dr/SR-71 SB Off-Ramp at Butterfield Ranch Road	30	39
3. Brookwood Lane at Butterfield Ranch Road	6	5
4. Twin Knolls Drive at Butterfield Ranch Road	10	11
5. Mystic Canyon Drive at Butterfield Ranch Road	7	9
6. Butterfield Ranch Road at Pine Avenue	7	9

APPENDIX A

YEAR 2024 WITH PROJECT TRAFFIC CONDITIONS (45 DU) INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

Intersection Level Of Service Report
Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.144

Intersection Setup

Name	Shady View Drive			Shady View Drive			Mystic Canyon Drive			Mystic Canyon Drive		
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]	35.00			35.00			25.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Shady View Drive			Shady View Drive			Mystic Canyon Drive			Mystic Canyon Drive		
Base Volume Input [veh/h]	2	36	0	29	21	70	70	11	0	0	6	82
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	1.0000	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
Total Hourly Volume [veh/h]	2	36	0	29	21	70	70	11	0	0	6	82
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]	1	9	0	8	6	18	18	3	0	0	2	22
Total Analysis Volume [veh/h]	2	38	0	31	22	74	74	12	0	0	6	86
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	805	885	789	937
Degree of Utilization, x	0.05	0.14	0.11	0.10

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.16	0.50	0.37	0.33
95th-Percentile Queue Length [ft]	3.91	12.51	9.14	8.14
Approach Delay [s/veh]	7.70	7.75	8.12	7.26
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.71			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	45.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name	Shady View Drive			Shady View Drive			Butterfield Ranch Road			Butterfield Ranch Road		
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	1	1	0	1	0	0	0	1	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]	35.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Shady View Drive			Shady View Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	42	0	319	258	20	34	0	803	28	222	334	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	1.0000	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	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	0	319	258	20	34	0	803	28	222	334	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	1.0000
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]	11	0	84	68	5	9	0	211	7	58	88	0
Total Analysis Volume [veh/h]	44	0	336	272	21	36	0	845	29	234	352	0
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
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Permiss	Split	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	6	6	0	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	26	0	0	25	0	0	29	0	20	49	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	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	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No				No			No		No	No	
Maximum Recall	No				No			No		No	No	
Pedestrian Recall	No				No			No		No	No	
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
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

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	R	L	C	R	C	C	L	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
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]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	21	21	27	27	16	47
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.21	0.27	0.27	0.16	0.47
(v / s)_i Volume / Saturation Flow Rate	0.03	0.19	0.09	0.09	0.02	0.24	0.24	0.14	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	352	372	352	352	372	481	481	271	1679
d1, Uniform Delay [s]	32.33	38.72	34.46	34.48	32.14	35.52	35.52	41.03	15.80
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.31	0.31	0.11	0.11
I, 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]	0.73	27.47	3.59	3.62	0.52	16.59	16.59	8.04	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	0.13	0.90	0.42	0.42	0.10	0.91	0.91	0.86	0.21
d, Delay for Lane Group [s/veh]	33.06	66.19	38.04	38.10	32.66	52.11	52.11	49.07	15.86
Lane Group LOS	C	E	D	D	C	D	D	D	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.93	10.66	3.37	3.40	0.75	11.92	11.92	5.98	2.22
50th-Percentile Queue Length [ft/ln]	23.16	266.49	84.35	84.95	18.72	298.05	298.05	149.55	55.42
95th-Percentile Queue Length [veh/ln]	1.67	16.01	6.07	6.12	1.35	17.58	17.58	9.99	3.99
95th-Percentile Queue Length [ft/ln]	41.68	400.35	151.84	152.92	33.69	439.62	439.62	249.83	99.76

Movement, Approach, & Intersection Results

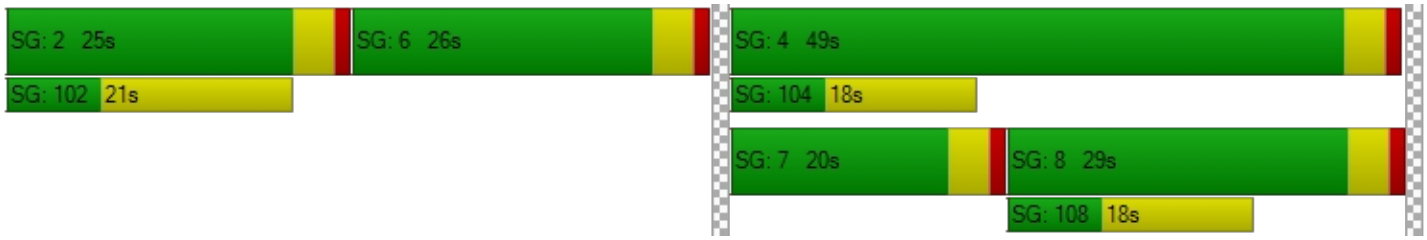
d_M, Delay for Movement [s/veh]	33.06	0.00	66.19	38.07	38.10	32.66	0.00	52.11	52.11	49.07	15.86	0.00
Movement LOS	C		E	D	D	C		D	D	D	B	
d_A, Approach Delay [s/veh]	62.36			37.48			52.11			29.13		
Approach LOS	E			D			D			C		
d_I, Intersection Delay [s/veh]	45.47											
Intersection LOS	D											
Intersection V/C	0.743											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.64	39.64	39.64	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.197	2.230	2.613	0.000
Crosswalk LOS	B	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	420	500	899
d_b, Bicycle Delay [s]	30.45	31.24	28.16	15.15
l_b,int, Bicycle LOS Score for Intersection	1.560	2.102	2.281	2.043
Bicycle LOS	A	B	B	B

Sequence

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



Intersection Level Of Service Report
Intersection 3: Brookwood Lane at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	15.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.354

Intersection Setup

Name	Brookwood Lane		Butterfield Ranch Road		Butterfield Ranch Road	
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	0	1	1	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]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Brookwood Lane		Butterfield Ranch Road		Butterfield Ranch Road	
Base Volume Input [veh/h]	280	46	53	455	317	50
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
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	280	46	53	455	317	50
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]	74	12	14	120	83	13
Total Analysis Volume [veh/h]	295	48	56	479	334	53
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	ProtPerm	Permissive	Permissive	Permissive
Signal Group	7	0	5	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	6	0	6	6	6	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	58	0	10	32	22	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	18	0	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	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
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	R	L	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	64	64	55	55
g / C, Green / Cycle	0.20	0.20	0.71	0.71	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.17	0.03	0.03	0.13	0.11	0.11
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	340	360	1238	2560	1108	1108
d1, Uniform Delay [s]	34.87	29.60	3.88	4.33	7.46	7.46
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.74	0.17	0.07	0.16	0.34	0.34
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.13	0.05	0.19	0.17	0.17
d, Delay for Lane Group [s/veh]	41.60	29.77	3.95	4.49	7.81	7.81
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.83	0.87	0.24	1.07	1.41	1.41
50th-Percentile Queue Length [ft/ln]	170.74	21.81	5.88	26.67	35.36	35.36
95th-Percentile Queue Length [veh/ln]	11.12	1.57	0.42	1.92	2.55	2.55
95th-Percentile Queue Length [ft/ln]	277.89	39.25	10.59	48.01	63.65	63.65

Movement, Approach, & Intersection Results

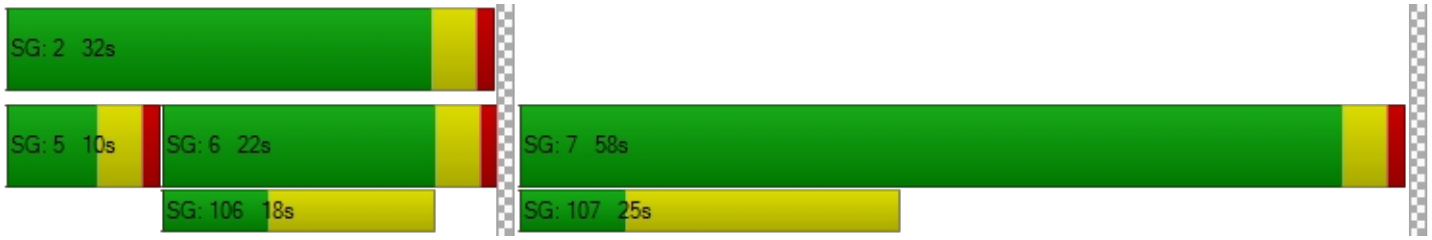
d_M, Delay for Movement [s/veh]	41.60	29.77	3.95	4.49	7.81	7.81
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.95		4.44		7.81	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.10					
Intersection LOS	B					
Intersection V/C	0.354					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	34.68	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.113	2.568	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	622	400
d_b, Bicycle Delay [s]	7.21	21.37	28.81
I_b,int, Bicycle LOS Score for Intersection	1.560	2.001	1.879
Bicycle LOS	A	B	A

Sequence

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



Intersection Level Of Service Report
Intersection 4: Twin Knolls Drive at Butterfield Ranch Road

Control Type:	Two-way stop	Delay (sec / veh):	19.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.142

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
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	1	0	0	1	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			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	44	0	179	7	0	8	8	302	43	72	296	11
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	1.0000	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
Total Hourly Volume [veh/h]	44	0	179	7	0	8	8	302	43	72	296	11
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]	12	0	47	2	0	2	2	79	11	19	78	3
Total Analysis Volume [veh/h]	46	0	188	7	0	8	8	318	45	76	312	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
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	0.14	0.00	0.23	0.03	0.00	0.01	0.01	0.00	0.00	0.06	0.00	0.00
d_M, Delay for Movement [s/veh]	19.37	21.04	12.61	19.09	18.38	9.54	7.94	0.00	0.00	8.23	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.69	1.69	1.69	0.11	0.11	0.11	0.02	0.00	0.00	0.20	0.00	0.00
95th-Percentile Queue Length [ft/ln]	42.32	42.32	42.32	2.81	2.81	2.81	0.49	0.00	0.00	5.10	0.00	0.00
d_A, Approach Delay [s/veh]	13.94			14.00			0.17			1.56		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.08											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.158

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
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	1	0	0	1	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]	40.00			40.00			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	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	54	0	2	5	0	39	24	324	44	7	308	7
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	1.0000	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	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	0	2	5	0	39	24	324	44	7	308	7
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]	14	0	1	1	0	10	6	85	12	2	81	2
Total Analysis Volume [veh/h]	57	0	2	5	0	41	25	341	46	7	324	7
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
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

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												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [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
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	37	0	0	37	0	0	53	0	0	53	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
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	7	0	0	7	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	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
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
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

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	70	70	12	12	12	12	12	12
g / C, Green / Cycle	0.77	0.77	0.14	0.14	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.01	0.11	0.11	0.00	0.09	0.09
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1394	1360	135	247	247	105	247	247
d1, Uniform Delay [s]	2.38	2.36	33.93	37.52	37.40	33.57	36.83	36.81
k, delay calibration	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.06	0.05	0.65	5.73	5.09	0.26	3.15	3.11
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.03	0.19	0.79	0.77	0.07	0.67	0.67
d, Delay for Lane Group [s/veh]	2.44	2.41	34.59	43.26	42.49	33.84	39.98	39.92
Lane Group LOS	A	A	C	D	D	C	D	D
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.16	0.13	0.48	4.35	4.19	0.13	3.50	3.48
50th-Percentile Queue Length [ft/ln]	4.09	3.17	12.02	108.83	104.68	3.35	87.54	87.08
95th-Percentile Queue Length [veh/ln]	0.29	0.23	0.87	7.78	7.54	0.24	6.30	6.27
95th-Percentile Queue Length [ft/ln]	7.35	5.71	21.64	194.38	188.42	6.03	157.57	156.75

Movement, Approach, & Intersection Results

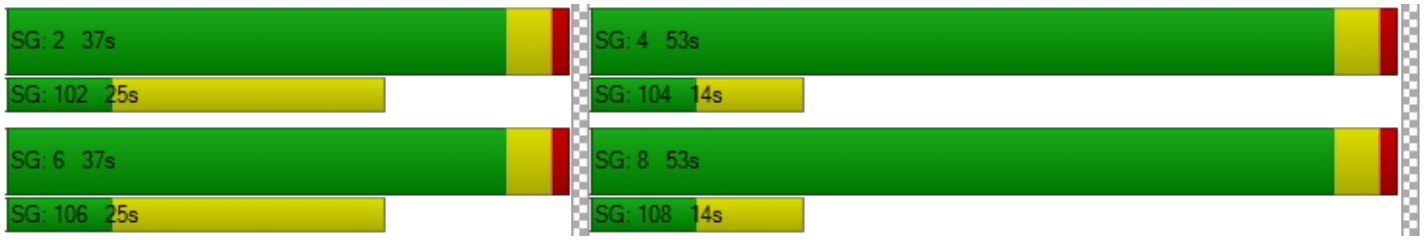
d_M, Delay for Movement [s/veh]	2.44	2.44	2.44	2.41	2.41	2.41	34.59	42.93	42.49	33.84	39.95	39.92
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.44			2.41			42.38			39.83		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.46											
Intersection LOS	D											
Intersection V/C	0.158											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.63	34.63	34.63	34.63
l_p,int, Pedestrian LOS Score for Intersection	1.797	1.801	2.624	2.507
Crosswalk LOS	A	A	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	734	734	1090	1090
d_b, Bicycle Delay [s]	18.01	18.01	9.31	9.31
l_b,int, Bicycle LOS Score for Intersection	1.657	1.636	1.900	1.838
Bicycle LOS	A	A	A	A

Sequence

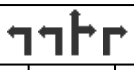
Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Butterfield Ranch Road at Pine Avenue

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.435

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
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	0	1	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]	50.00			55.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Base Volume Input [veh/h]	32	484	420	87	389	85	58	66	38	146	38	59
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	1.0000	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	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	484	420	87	389	85	58	66	38	146	38	59
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]	8	127	111	23	102	22	15	17	10	38	10	16
Total Analysis Volume [veh/h]	34	509	442	92	409	89	61	69	40	154	40	62
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]	95
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	35	35	10	22	0	11	40	0	10	39	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	11	0	0	21	0	0	28	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	2.0	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	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
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
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

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	L	C	R
C, Cycle Length [s]	95	95	95	95	95	95	95	95	95	95	95
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
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
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	60	70	6	62	62	5	7	6	9	9
g / C, Green / Cycle	0.04	0.63	0.74	0.06	0.65	0.65	0.05	0.08	0.06	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.25	0.03	0.11	0.05	0.04	0.06	0.05	0.03	0.03
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	1700	1800	3200	1800	1800
c, Capacity [veh/h]	66	2268	1325	188	2340	1170	88	143	205	165	165
d1, Uniform Delay [s]	44.87	7.59	4.40	43.41	6.58	6.14	44.38	42.94	43.79	40.47	40.35
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	6.15	0.23	0.68	1.98	0.16	0.13	9.39	8.20	5.47	1.13	0.98
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
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
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

Lane Group Results

X, volume / capacity	0.52	0.22	0.33	0.49	0.17	0.08	0.69	0.76	0.75	0.32	0.29
d, Delay for Lane Group [s/veh]	51.02	7.82	5.07	45.39	6.74	6.26	53.77	51.14	49.26	41.59	41.34
Lane Group LOS	D	A	A	D	A	A	D	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.86	1.83	2.10	1.04	1.25	0.53	1.60	2.76	1.89	1.19	1.08
50th-Percentile Queue Length [ft/ln]	21.56	45.86	52.44	25.98	31.24	13.17	40.09	69.02	47.16	29.73	26.93
95th-Percentile Queue Length [veh/ln]	1.55	3.30	3.78	1.87	2.25	0.95	2.89	4.97	3.40	2.14	1.94
95th-Percentile Queue Length [ft/ln]	38.80	82.55	94.40	46.77	56.24	23.71	72.17	124.24	84.89	53.51	48.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.02	7.82	5.07	45.39	6.74	6.26	53.77	51.14	51.14	49.26	41.59	41.39
Movement LOS	D	A	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.08			12.70			52.08			46.16		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	18.05											
Intersection LOS	B											
Intersection V/C	0.435											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.18	37.18	37.18	37.18
l_p,int, Pedestrian LOS Score for Intersection	2.885	2.908	2.087	2.641
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	652	379	757	736
d_b, Bicycle Delay [s]	21.59	31.24	18.36	18.98
l_b,int, Bicycle LOS Score for Intersection	2.372	2.046	1.840	1.982
Bicycle LOS	B	B	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.150

Intersection Setup

Name	Shady View Drive			Shady View Drive			Mystic Canyon Drive			Mystic Canyon Drive		
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]	35.00			35.00			25.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Shady View Drive			Shady View Drive			Mystic Canyon Drive			Mystic Canyon Drive		
Base Volume Input [veh/h]	1	28	1	47	45	33	38	15	6	0	3	47
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	1.0000	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
Total Hourly Volume [veh/h]	1	28	1	47	45	33	38	15	6	0	3	47
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	7	0	12	12	9	10	4	2	0	1	12
Total Analysis Volume [veh/h]	1	29	1	49	47	35	40	16	6	0	3	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	838	873	817	951
Degree of Utilization, x	0.04	0.15	0.08	0.05

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.12	0.53	0.25	0.17
95th-Percentile Queue Length [ft]	2.88	13.17	6.14	4.33
Approach Delay [s/veh]	7.46	7.85	7.77	7.01
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.63			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	51.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.655

Intersection Setup

Name	Shady View Drive			Shady View Drive			Butterfield Ranch Road			Butterfield Ranch Road		
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	1	1	0	1	0	0	0	1	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]	35.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Shady View Drive			Shady View Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	38	0	171	746	102	109	0	385	78	148	260	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	1.0000	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	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	0	171	746	102	109	0	385	78	148	260	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	1.0000
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]	10	0	45	196	27	29	0	101	21	39	68	0
Total Analysis Volume [veh/h]	40	0	180	785	107	115	0	405	82	156	274	0
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
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Permiss	Split	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	6	6	0	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	0	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	0	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	10	0	0	25	0	0	22	0	63	85	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	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	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No				No			No		No	No	
Maximum Recall	No				No			No		No	No	
Pedestrian Recall	No				No			No		No	No	
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
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

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	R	L	C	R	C	C	L	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
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]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	36	36	36	36	19	19	13	36
g / C, Green / Cycle	0.30	0.30	0.30	0.30	0.30	0.16	0.16	0.11	0.30
(v / s)_i Volume / Saturation Flow Rate	0.02	0.10	0.26	0.26	0.06	0.14	0.14	0.09	0.08
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	510	540	510	510	540	283	283	186	1079
d1, Uniform Delay [s]	30.12	32.68	39.88	39.88	31.42	49.34	49.34	52.47	31.88
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
I, 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]	0.30	1.65	18.45	18.45	0.90	7.98	7.98	9.67	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
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	0.08	0.33	0.87	0.87	0.21	0.86	0.86	0.84	0.25
d, Delay for Lane Group [s/veh]	30.42	34.34	58.33	58.33	32.32	57.32	57.32	62.14	32.00
Lane Group LOS	C	C	E	E	C	E	E	E	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.87	4.29	14.84	14.84	2.62	7.54	7.54	4.99	2.96
50th-Percentile Queue Length [ft/ln]	21.77	107.29	370.98	370.98	65.46	188.54	188.54	124.79	73.92
95th-Percentile Queue Length [veh/ln]	1.57	7.69	21.16	21.16	4.71	12.05	12.05	8.66	5.32
95th-Percentile Queue Length [ft/ln]	39.18	192.23	528.91	528.91	117.83	301.14	301.14	216.39	133.05

Movement, Approach, & Intersection Results

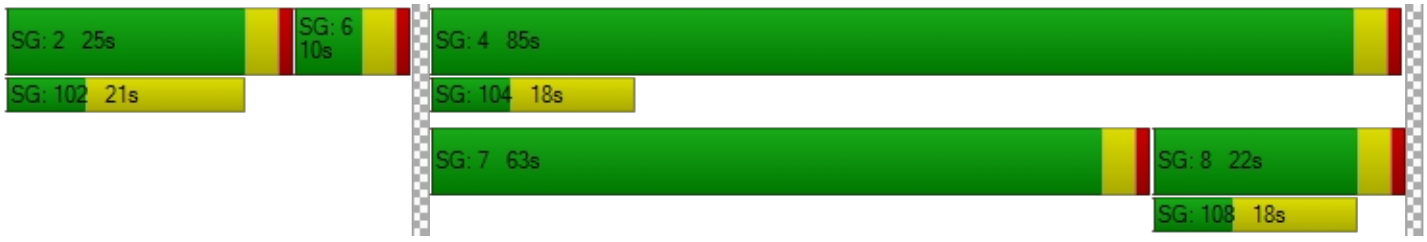
d_M, Delay for Movement [s/veh]	30.42	0.00	34.34	58.33	58.33	32.32	0.00	57.32	57.32	62.14	32.00	0.00
Movement LOS	C		C	E	E	C		E	E	E	C	
d_A, Approach Delay [s/veh]	33.63			55.36			57.32			42.94		
Approach LOS	C			E			E			D		
d_I, Intersection Delay [s/veh]	51.08											
Intersection LOS	D											
Intersection V/C	0.655											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.54	49.54	49.54	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.168	2.431	2.480	0.000
Crosswalk LOS	B	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	350	300	1349
d_b, Bicycle Delay [s]	54.18	40.87	43.38	6.35
l_b,int, Bicycle LOS Score for Intersection	1.560	3.221	1.961	1.914
Bicycle LOS	A	C	A	A

Sequence

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



Intersection Level Of Service Report
Intersection 3: Brookwood Lane at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.331

Intersection Setup

Name	Brookwood Lane		Butterfield Ranch Road		Butterfield Ranch Road	
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	0	1	1	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]	25.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Brookwood Lane		Butterfield Ranch Road		Butterfield Ranch Road	
Base Volume Input [veh/h]	184	40	71	540	467	77
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
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	184	40	71	540	467	77
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]	48	11	19	142	123	20
Total Analysis Volume [veh/h]	194	42	75	568	492	81
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	ProtPerm	Permissive	Permissive	Permissive
Signal Group	7	0	5	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	6	0	6	6	6	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	58	0	10	32	22	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	18	0	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	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
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	R	L	C	C	C
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	13	69	69	60	60
g / C, Green / Cycle	0.14	0.14	0.77	0.77	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.11	0.02	0.04	0.16	0.16	0.16
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	237	251	1310	2778	1205	1205
d1, Uniform Delay [s]	37.63	34.13	2.46	2.79	5.84	5.84
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.80	0.31	0.08	0.17	0.46	0.46
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.17	0.06	0.20	0.24	0.24
d, Delay for Lane Group [s/veh]	44.43	34.44	2.54	2.95	6.31	6.31
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.58	0.83	0.20	0.79	1.75	1.75
50th-Percentile Queue Length [ft/ln]	114.49	20.82	4.96	19.65	43.73	43.73
95th-Percentile Queue Length [veh/ln]	8.09	1.50	0.36	1.41	3.15	3.15
95th-Percentile Queue Length [ft/ln]	202.23	37.48	8.92	35.37	78.72	78.72

Movement, Approach, & Intersection Results

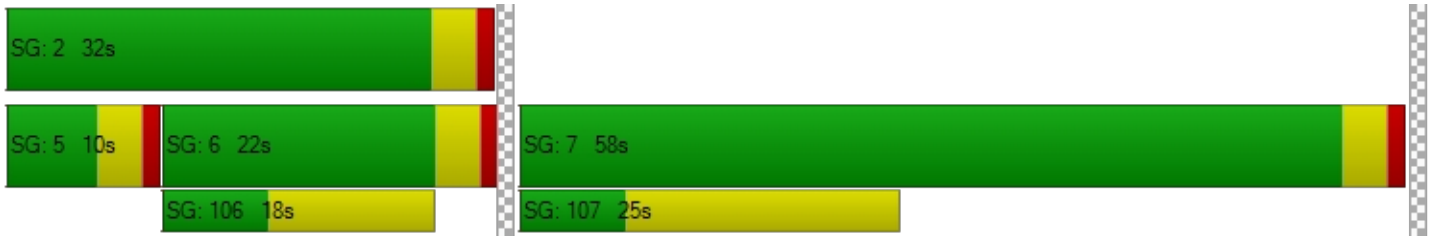
d_M, Delay for Movement [s/veh]	44.43	34.44	2.54	2.95	6.31	6.31
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.66		2.91		6.31	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.71					
Intersection LOS	B					
Intersection V/C	0.331					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	34.68	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.120	2.644	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1200	622	400
d_b, Bicycle Delay [s]	7.21	21.37	28.81
l_b,int, Bicycle LOS Score for Intersection	1.560	2.090	2.032
Bicycle LOS	A	B	B

Sequence

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



Intersection Level Of Service Report
Intersection 4: Twin Knolls Drive at Butterfield Ranch Road

Control Type:	Two-way stop	Delay (sec / veh):	40.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
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	1	0	0	1	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			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	44	2	91	2	0	7	12	518	107	125	360	12
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	1.0000	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
Total Hourly Volume [veh/h]	44	2	91	2	0	7	12	518	107	125	360	12
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]	12	1	24	1	0	2	3	136	28	33	95	3
Total Analysis Volume [veh/h]	46	2	96	2	0	7	13	545	113	132	379	13
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
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	0.31	0.01	0.14	0.01	0.00	0.01	0.01	0.01	0.00	0.14	0.00	0.00
d_M, Delay for Movement [s/veh]	38.51	40.56	20.03	27.56	32.98	9.61	8.13	0.00	0.00	9.53	0.00	0.00
Movement LOS	E	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.33	2.33	2.33	0.06	0.06	0.06	0.03	0.00	0.00	0.50	0.00	0.00
95th-Percentile Queue Length [ft/ln]	58.28	58.28	58.28	1.61	1.61	1.61	0.85	0.00	0.00	12.41	0.00	0.00
d_A, Approach Delay [s/veh]	26.22			13.60			0.16			2.40		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	3.90											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.305

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
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	1	0	0	1	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]	40.00			40.00			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	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	67	6	18	2	8	36	57	562	166	11	420	6
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	1.0000	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	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	67	6	18	2	8	36	57	562	166	11	420	6
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]	18	2	5	1	2	9	15	148	44	3	111	2
Total Analysis Volume [veh/h]	71	6	19	2	8	38	60	592	175	12	442	6
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
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

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												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [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
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	29	0	0	29	0	0	61	0	0	61	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
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	7	0	0	7	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	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
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
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

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59	23	23	23	23	23	23
g / C, Green / Cycle	0.66	0.66	0.26	0.26	0.26	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.06	0.03	0.04	0.22	0.20	0.01	0.12	0.12
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1186	1158	295	458	458	119	458	458
d1, Uniform Delay [s]	5.62	5.45	25.88	32.07	31.39	25.14	28.52	28.51
k, delay calibration	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.07	0.34	5.23	3.36	0.37	0.81	0.81
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.04	0.20	0.87	0.80	0.10	0.49	0.49
d, Delay for Lane Group [s/veh]	5.75	5.52	26.22	37.30	34.75	25.51	29.33	29.31
Lane Group LOS	A	A	C	D	C	C	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh/ln]	0.58	0.28	0.96	8.37	7.40	0.19	3.96	3.94
50th-Percentile Queue Length [ft/ln]	14.46	7.03	24.08	209.16	184.89	4.85	98.98	98.59
95th-Percentile Queue Length [veh/ln]	1.04	0.51	1.73	13.11	11.86	0.35	7.13	7.10
95th-Percentile Queue Length [ft/ln]	26.04	12.65	43.34	327.75	296.39	8.73	178.16	177.46

Movement, Approach, & Intersection Results

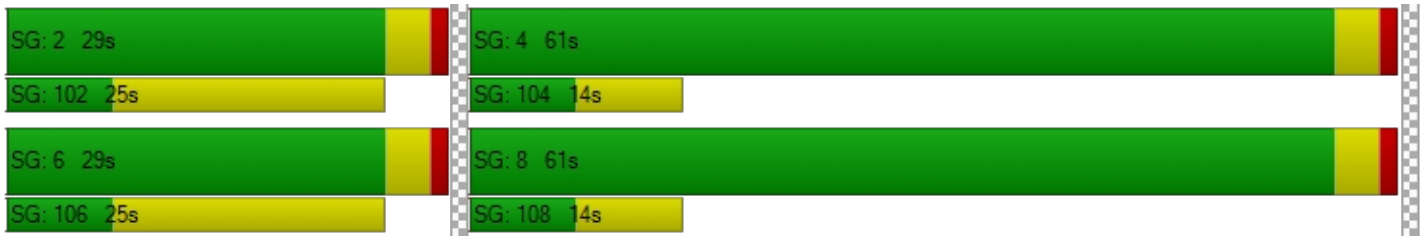
d_M, Delay for Movement [s/veh]	5.75	5.75	5.75	5.52	5.52	5.52	26.22	36.47	34.75	25.51	29.32	29.31
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.75			5.52			35.36			29.23		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.40											
Intersection LOS	C											
Intersection V/C	0.305											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.63	34.63	34.63	34.63
l_p,int, Pedestrian LOS Score for Intersection	1.921	1.878	2.803	2.616
Crosswalk LOS	A	A	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1268	1268
d_b, Bicycle Delay [s]	23.43	23.43	6.02	6.02
l_b,int, Bicycle LOS Score for Intersection	1.718	1.639	2.242	1.939
Bicycle LOS	A	A	B	A

Sequence

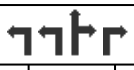
Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Butterfield Ranch Road at Pine Avenue

Control Type:	Signalized	Delay (sec / veh):	60.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
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	0	1	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]	50.00			55.00			40.00			40.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Base Volume Input [veh/h]	36	271	328	51	604	13	2	36	76	1135	111	156
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	1.0000	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	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	271	328	51	604	13	2	36	76	1135	111	156
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]	9	71	86	13	159	3	1	9	20	299	29	41
Total Analysis Volume [veh/h]	38	285	345	54	636	14	2	38	80	1195	117	164
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
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	30	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	22	35	35	10	23	0	10	32	0	43	65	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	11	0	0	21	0	0	28	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	2.0	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	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No	No	No	No		No	No		No	No	
Maximum Recall	No	No	No	No	No		No	No		No	No	
Pedestrian Recall	No	No	No	No	No		No	No		No	No	
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
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

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	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
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
l2, Clearance Lost Time [s]	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	4	50	93	5	51	51	0	10	39	48	48
g / C, Green / Cycle	0.04	0.42	0.78	0.04	0.42	0.42	0.00	0.08	0.32	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.02	0.08	0.19	0.02	0.18	0.01	0.00	0.07	0.37	0.08	0.08
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	1700	1800	3200	1800	1800
c, Capacity [veh/h]	63	1504	1396	136	1525	763	7	147	1038	724	724
d1, Uniform Delay [s]	56.97	22.09	3.74	55.97	24.22	20.10	59.60	54.15	40.56	23.28	23.28
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.14	0.11	0.11
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
d2, Incremental Delay [s]	9.15	0.28	0.42	1.86	0.84	0.04	19.99	9.57	71.60	0.13	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
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
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

Lane Group Results

X, volume / capacity	0.61	0.19	0.25	0.40	0.42	0.02	0.28	0.80	1.15	0.19	0.19
d, Delay for Lane Group [s/veh]	66.12	22.37	4.16	57.83	25.06	20.14	79.59	63.72	112.16	23.40	23.40
Lane Group LOS	E	C	A	E	C	C	E	E	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.26	2.47	1.73	0.80	6.04	0.22	0.10	3.84	25.06	2.55	2.55
50th-Percentile Queue Length [ft/ln]	31.51	61.83	43.23	20.05	151.07	5.59	2.49	95.93	626.50	63.82	63.82
95th-Percentile Queue Length [veh/ln]	2.27	4.45	3.11	1.44	10.07	0.40	0.18	6.91	36.32	4.60	4.60
95th-Percentile Queue Length [ft/ln]	56.72	111.30	77.81	36.08	251.85	10.06	4.48	172.67	907.89	114.88	114.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	66.12	22.37	4.16	57.83	25.06	20.14	79.59	63.72	63.72	112.16	23.40	23.40
Movement LOS	E	C	A	E	C	C	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	15.46			27.48			63.98			95.26		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	59.96											
Intersection LOS	E											
Intersection V/C	0.736											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	3.165	2.903	2.079	2.881
Crosswalk LOS	C	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]	517	317	467	1016
d_b, Bicycle Delay [s]	33.02	42.52	35.28	14.52
l_b,int, Bicycle LOS Score for Intersection	2.111	2.140	1.758	3.995
Bicycle LOS	B	B	A	D

Sequence

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