

REVISED TRAFFIC STUDY
SHADY VIEW PROJECT
(TENTATIVE TRACT MAP 20317)

Chino Hills, California
February 11, 2022
(Original dated April 6, 2021)

Prepared for:

CITY OF CHINO HILLS
Community Development Department
14000 City Center Drive
Chino Hills, CA 91709

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Prepared by:
Shane S. Green, P.E.
Senior Transportation Engineer
And
Megan Lam
Transportation Engineer II

Under the Supervision of:
Richard E. Barretto, P.E.
Principal

**Linscott, Law &
Greenspan, Engineers**

2 Executive Circle
Suite 250
Irvine, CA 92614

949.825.6175 T

949.825.6173 F

www.llgengineers.com

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1.0 INTRODUCTION

This Traffic Study addresses the potential traffic impacts and circulation needs associated with the proposed Shady View (Tentative Tract Map 20317) Project in the City of Chino Hills. The Project site is a 130-acre vacant parcel of land 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 proposed Project includes the development of a new 159 dwelling unit (DU) single-family residential community to include a community center and approximately 72-acres of association-maintained open space.

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential circulation impacts that the proposed Project may have on the local and regional network in the vicinity of the Project.

1.1 Scope of Work

The Scope of Work for this Project was developed in conjunction with City staff and satisfies the City of Chino Hills requirements as outlined the *Traffic Impact Study Guidelines for Development Projects in the City of Chino Hills (dated 10/15/01)* and is consistent with the current *Congestion Management Program (CMP) for San Bernardino County, 2016 Update Traffic Impact Analysis Report Guidelines*, prepared by the SANBAG. **Appendix A** contains the Scope of Work memorandum as approved by the City of Chino Hills.

The traffic analysis evaluates the existing operating conditions at six (6) key study intersections within the Project vicinity, estimates the trip generation potential of the proposed Project and forecasts future operating conditions without and with the proposed Project. Where necessary, intersection improvements are recommended.

The Project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing peak hour traffic information has been collected at six (6) key study intersections for use in the preparation of intersection level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of Chino Hills and City of Chino. Based on our research, there are twenty-three (23) cumulative projects in the City of Chino Hills and City of Chino. These twenty-

three (23) planned and/or approved cumulative projects were considered in the cumulative traffic analysis for this Project.

This traffic report analyzes existing and future weekday AM peak hour and PM peak hour traffic conditions for a near-term (Year 2024) and long-term (Year 2040) traffic setting upon completion of the proposed Project. Peak hour traffic forecasts for the Year 2024 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of 2.0% per year and adding traffic volumes generated by twenty-three (23) cumulative projects. Long-term (Year 2040) traffic projections were derived from the San Bernardino County Traffic Analysis Model (SBTAM).

1.2 Study Area

The six (6) study intersections were selected for evaluation utilizing CMP analysis criteria and requirements of the City of Chino Hills (i.e. “50 peak hour trip criterion”), as well as proximity to the Project site. The six (6) existing key study intersections listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. The jurisdictions where the study intersections are located are identified as well:

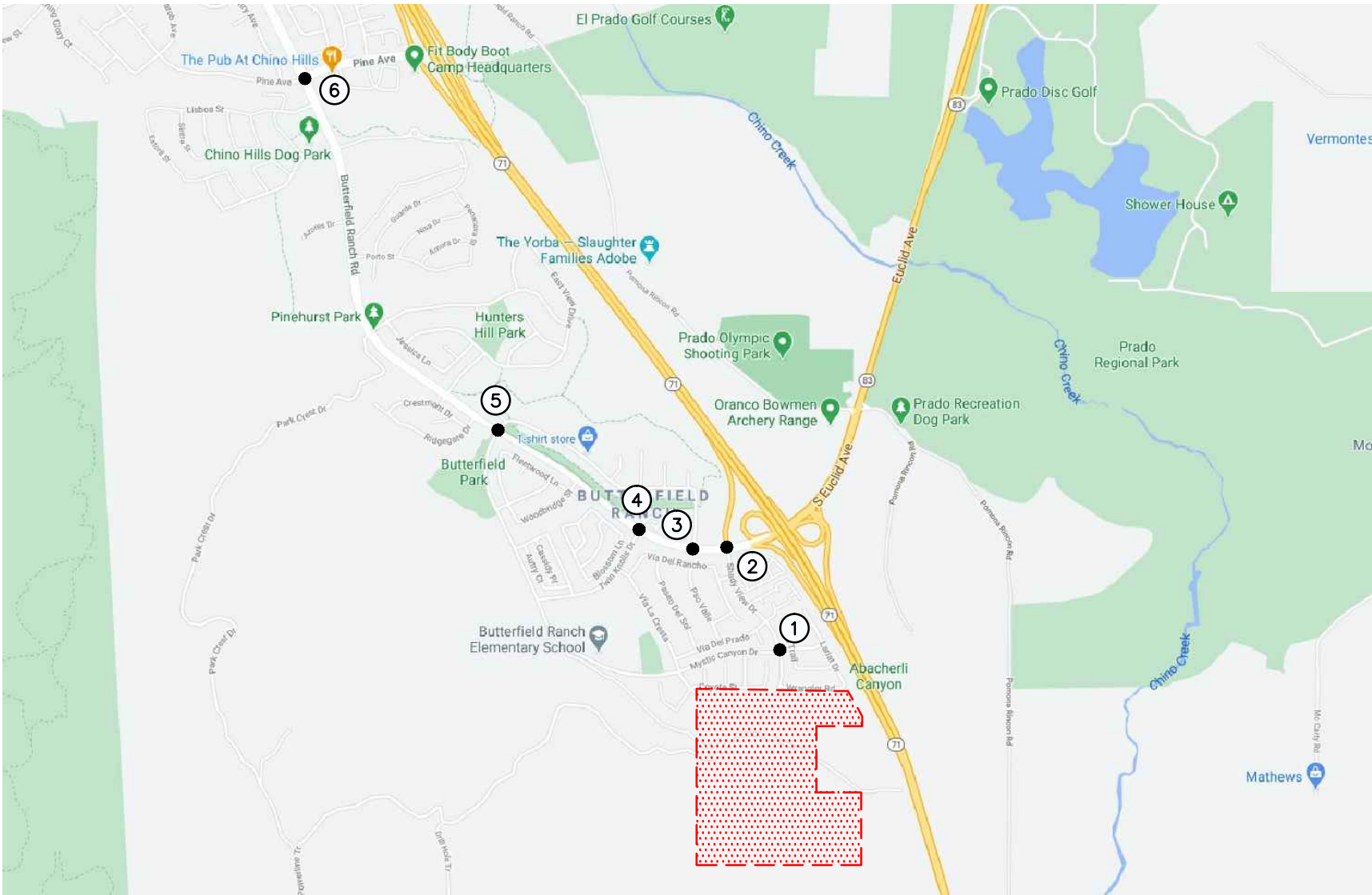
Key Intersection	Jurisdiction
1. Shady View Drive at Mystic Canyon Drive	Chino Hills
2. Shady View Drive/SR-71 Off-Ramp at Butterfield Ranch Road	Chino Hills/Caltrans
3. Brookwood Lane at Butterfield Ranch Road	Chino Hills
4. Twin Knolls Drive at Butterfield Ranch Road	Chino Hills
5. Mystic Canyon Drive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

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the proposed Project and depicts the study locations and surrounding street system. The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed Project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or off-set the impact of the Project.

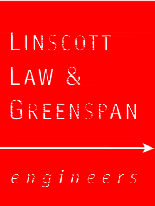
Included in this Traffic Impact Analysis are:

- Existing traffic counts,
- Estimated Project traffic generation/distribution/assignment,
- Estimated cumulative projects traffic generation/distribution/assignment,
- AM and PM peak hour capacity analyses for existing conditions,
- AM and PM peak hour capacity analyses for existing plus Project conditions,
- AM and PM peak hour capacity analyses for near-term (Year 2024) conditions without and with Project traffic,

- AM and PM peak hour capacity analyses for long-term (Year 2040) conditions without and with Project traffic,
- Area Traffic Improvements and Mitigations,
- Signal Warrant assessment,
- Site Access and Internal Circulation, and
- Alternative Project analysis.



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SOURCE: GOOGLE

KEY

- = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 1-1

VICINITY MAP
SHADY VIEW PROJECT, CHINO HILLS

2.0 PROJECT DESCRIPTION

2.1 Project Description and Site Access

The Project site is a 130-acre vacant parcel of land 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. *Figure 2-1* presents an existing aerial photograph of the Project site.

The Project applicant is proposing to develop a new 159 DU single-family residential community to include a community center and approximately 72-acres of association-maintained open space. Vehicular access to the proposed Project will be provided via the proposed extension of Shady View Drive and Via La Cresta from its current southerly terminus into the Project site to connect to a proposed local residential network of streets. *Figure 2-2* presents the proposed site plan prepared by Hunsaker and Associates.

Per the direction of City staff, an alternative assessment assuming access from the extension of Via La Cresta will be restricted to “emergency use only” will also be evaluated in Section 13.0 of this traffic assessment. Under this access option, direct access to and from the site would be provided via Shady View Drive.

The Project is expected to be constructed in several phases over the next couple of years or so by 2024, but is dependent on several factors, including the Project funding and market conditions. Hence, Year 2024 will be utilized to assess the full Project’s potential opening year (full buildout/occupancy) traffic impacts within a near-term cumulative traffic setting to provide a conservative assessment.

2.2 Pedestrian Circulation

Pedestrian circulation would be provided via existing sidewalks along Via La Cresta and Shady View Drive within the adjacent residential communities. The proposed Project will construct sidewalks to connect to the existing sidewalks along Via La Cresta and Shady View Drive. The existing sidewalk system within the Project vicinity provides direct connectivity to the major thoroughfares of Butterfield Ranch Road and pedestrian connectivity to the existing residential, recreational, institutional, and commercial development in the surrounding area.



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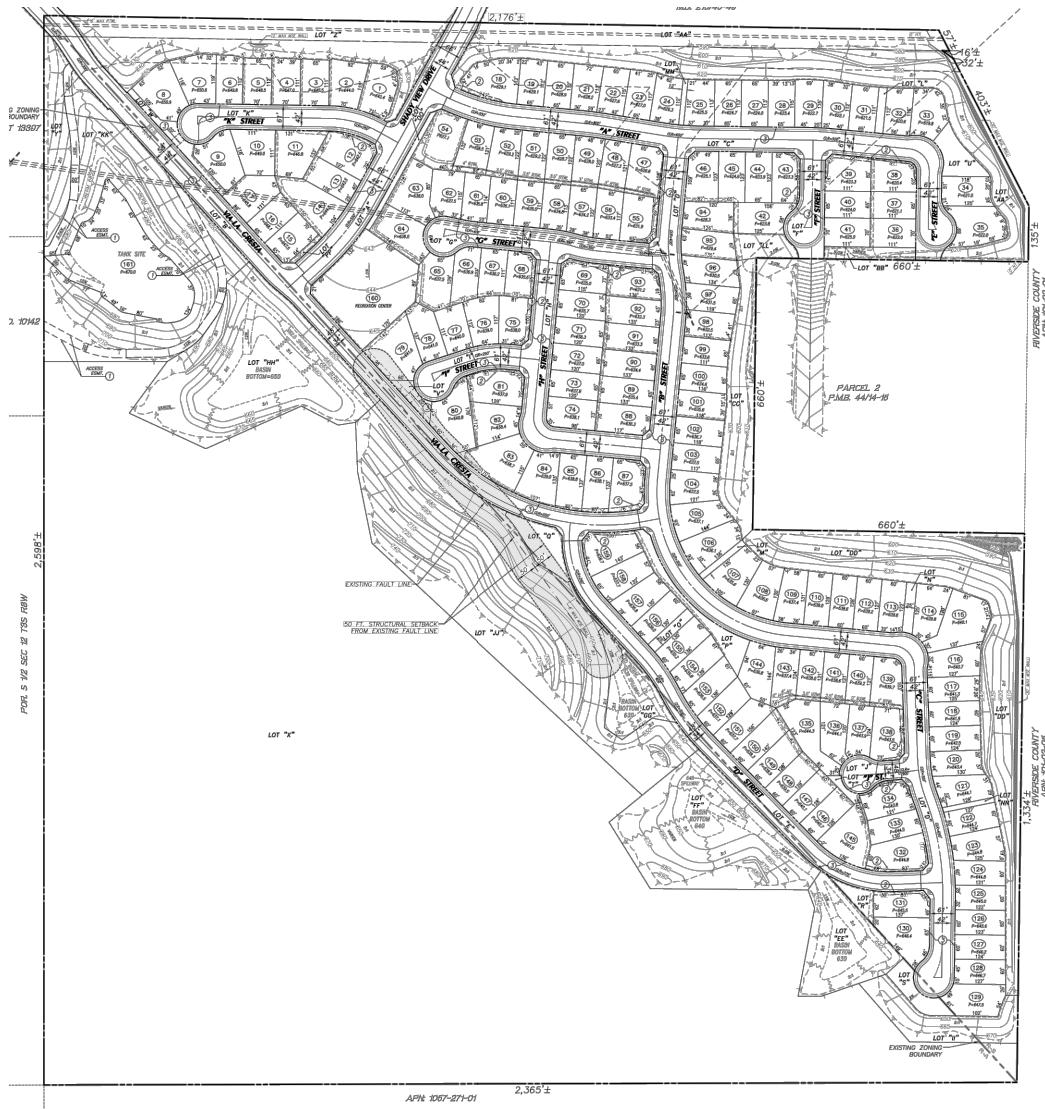
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KEY

 = PROJECT SITE

FIGURE 2-1

EXISTING SITE AERIAL
SHADY VIEW PROJECT, CHINO HILLS

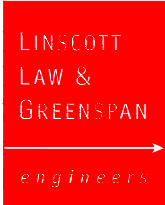


SOURCE: HUNSAKER AND ASSOCIATES

FIGURE 2-2

PROPOSED SITE PLAN

SHADY VIEW PROJECT, CHINO HILLS



3.0 EXISTING CONDITIONS

The Chino Valley Freeway (State Route-71) provides primary regional access to the proposed Project site via the freeway interchange at Butterfield Ranch Road. The principal local network of streets serving the Project site consists of Shady View Drive, Mystic Canyon Drive, Twin Knolls Drive, Via La Cresta, and Butterfield Ranch Road. The following discussion provides a brief synopsis of these key area streets.

3.1 Existing Street Network

Shady View Drive is a north-south, two-lane local residential roadway that currently extends south approximately 0.4 miles from Butterfield Ranch Road to the Project's northerly boundary. The posted speed limit on Shady View Drive is 35 miles per hour (mph). On-street parking is only permitted on the west side of the roadway between Via Entrada and Laurelton Lane. The intersection of Mystic Canyon Drive at Shady View Drive is All-Way Stop Controlled, whereas all other residential streets that feed into Shady View Drive are Two-Way (Side Street) Stop Controlled. A traffic signal controls the study intersection of Shady View Drive at Butterfield Ranch Road.

Mystic Canyon Drive is an east-west, two-lane local residential collector street similar to Shady View Drive. This street extends southeasterly approximately 0.9 miles from Butterfield Ranch Road to the Project site. The posted speed limit on Mystic Canyon Drive is 35 mph. On-street parking is only permitted on both sides of the roadway east of Shady View Drive within the vicinity of the Project. Butterfield Ranch Elementary School is located along Mystic Canyon Drive.

Twin Knolls Drive is a north-south, two-lane local residential collector located north of the Project. The prima facie speed limit on Twin Knolls Drive is 25 mph. On-street parking is permitted intermittently along the roadway within the vicinity of the Project. Twin Knolls Drive is currently stop controlled at Butterfield Ranch Road.

Via La Cresta is a north-south, two-lane local residential street that extends southeasterly approximately 0.5 miles from Butterfield Ranch Road via Twin Knolls Drive to the Project site. This local street is currently developed with single-family homes with individual driveway access. Via La Cresta at Mystic Canyon Drive, and Via La Cresta at Twin Knolls Drive are both Stop (side street) Controlled. The posted speed limit on Via La Cresta is 25 mph. On-street parking is generally permitted on the both sides of the roadway within the vicinity of the Project.

Butterfield Ranch Road is generally an east-west, four-lane divided roadway located north of the Project. The posted speed limit on Butterfield Ranch Road is 45 mph. On-street parking is generally not permitted on either side of the roadway within the vicinity of the Project. Traffic signals control the study intersections of Shady View Drive, Brookwood Lane, Mystic Canyon Drive and Pine Avenue. Per the City of Chino Hills General Plan Circulation Element, Butterfield Ranch Road is classified as a Minor Arterial south of Pine Avenue. The City of Chino Hills Bicycle Master Plan identifies Butterfield Ranch Road as a Class II bicycle facility.

Figure 3-1 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this report. This figure identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections. **Figure 3-2** presents the Chino Hills Bicycle Master Plan.

3.1.1 Public Transit

Public transit bus service is provided in the Project area by OmniTrans, a public transportation agency in San Bernardino County. In September 2020, OmniTrans launched a new micro transit service known as OmniRide, which is a reservation-based, on-demand transit service similar to that of Uber and Lyft. Trips can be reserved either over the phone or by using the OmniRide On-Demand mobile app between the hours of 6:00 AM and 8:00 PM on weekdays only. The OmniRide service will pick-up and drop-off at a “virtual stop”; the nearest virtual stops located within the Project vicinity are at Butterfield Ranch Elementary School and at the intersection of Shady View Drive and Mystic Canyon Drive.

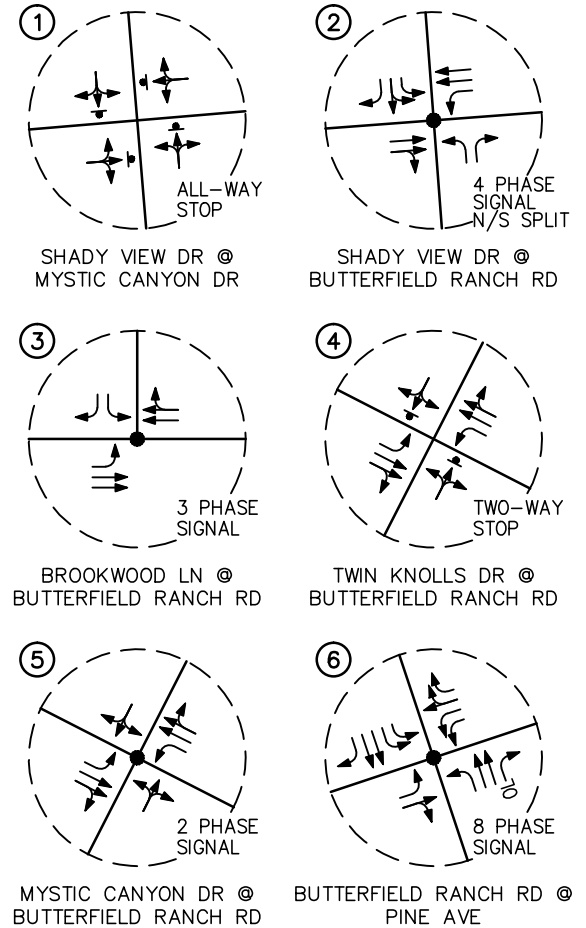
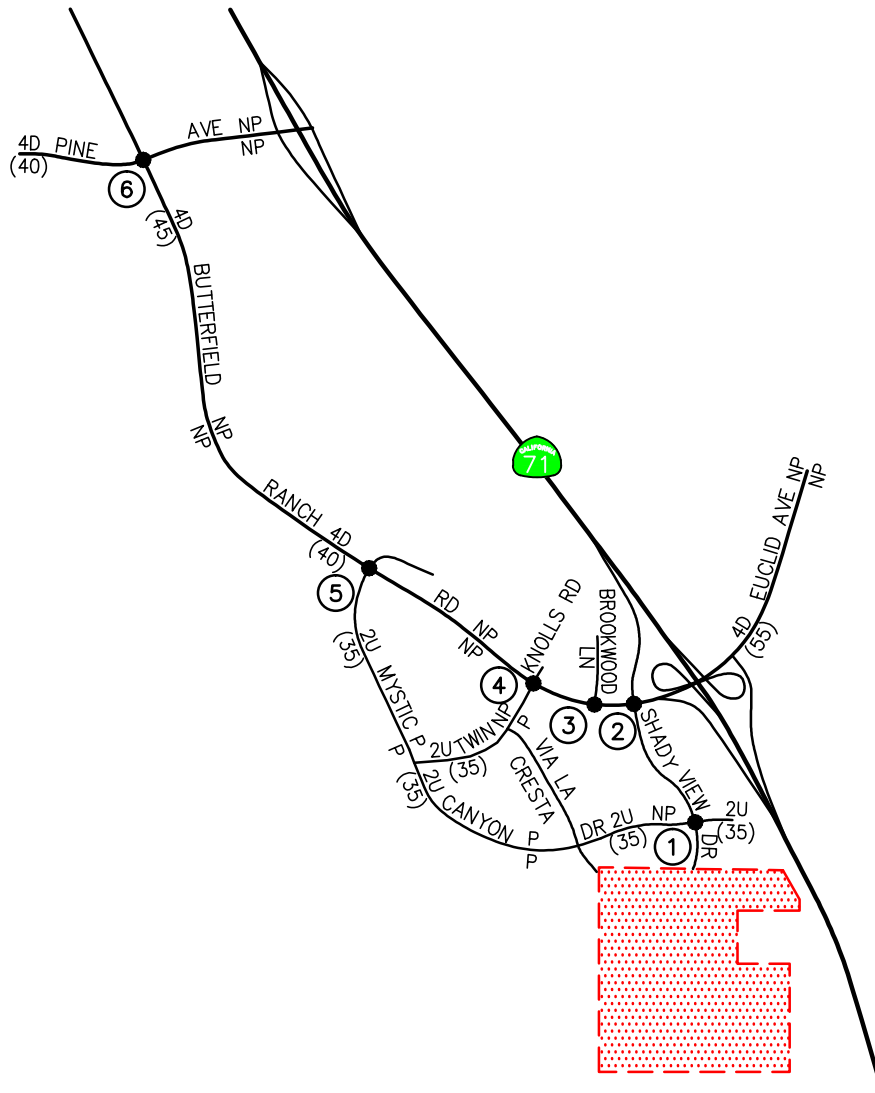
It should be noted that OmniRide replaced the OmniGo Route 365 and the Access ADA Service which previously served the Chino and Chino Hills communities. A modified Route 365 is planned to remain, in a post-COVID-19 environment, to provide school tripper service to Chino Hills High School students when in-person teaching resumes.

3.2 Existing Traffic Volumes

Six (6) key study intersections have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential Project-related traffic will pass through each of these intersections and their analysis will reveal the expected relative impacts of the Project.

Due to the COVID-19 virus, the Governor of California has issued a state-wide “stay at home” order which has ultimately resulted in a decrease in traffic. Based on these current conditions, the ability to collect traffic counts to establish baseline conditions that would be reflective of traffic conditions without “stay at home” orders in effect are not possible. As such, to establish “baseline” traffic conditions, pre-COVID-19 (i.e. under normal circumstances without “stay at home” orders in effect), LLG has researched historic data and was able to obtain Year 2015 counts at one (1) study location and Year 2020 pre-COVID-19 counts at one (1) location, as summarized below:

Key Intersection	Historic Traffic Counts Available	Collect Year 2020 Covid-19 Traffic Counts
1. Shady View Drive at Mystic Canyon Drive	--	Yes
2. Shady View Drive/SR-71 Off-Ramp at Butterfield Ranch Road	2015	Yes
3. Brookwood Lane at Butterfield Ranch Road	--	Yes
4. Twin Knolls Drive at Butterfield Ranch Road	--	Yes
5. Mystic Canyon Drive at Butterfield Ranch Road	--	Yes
6. Butterfield Ranch Road at Pine Avenue	2020 Pre-COVID-19	Yes



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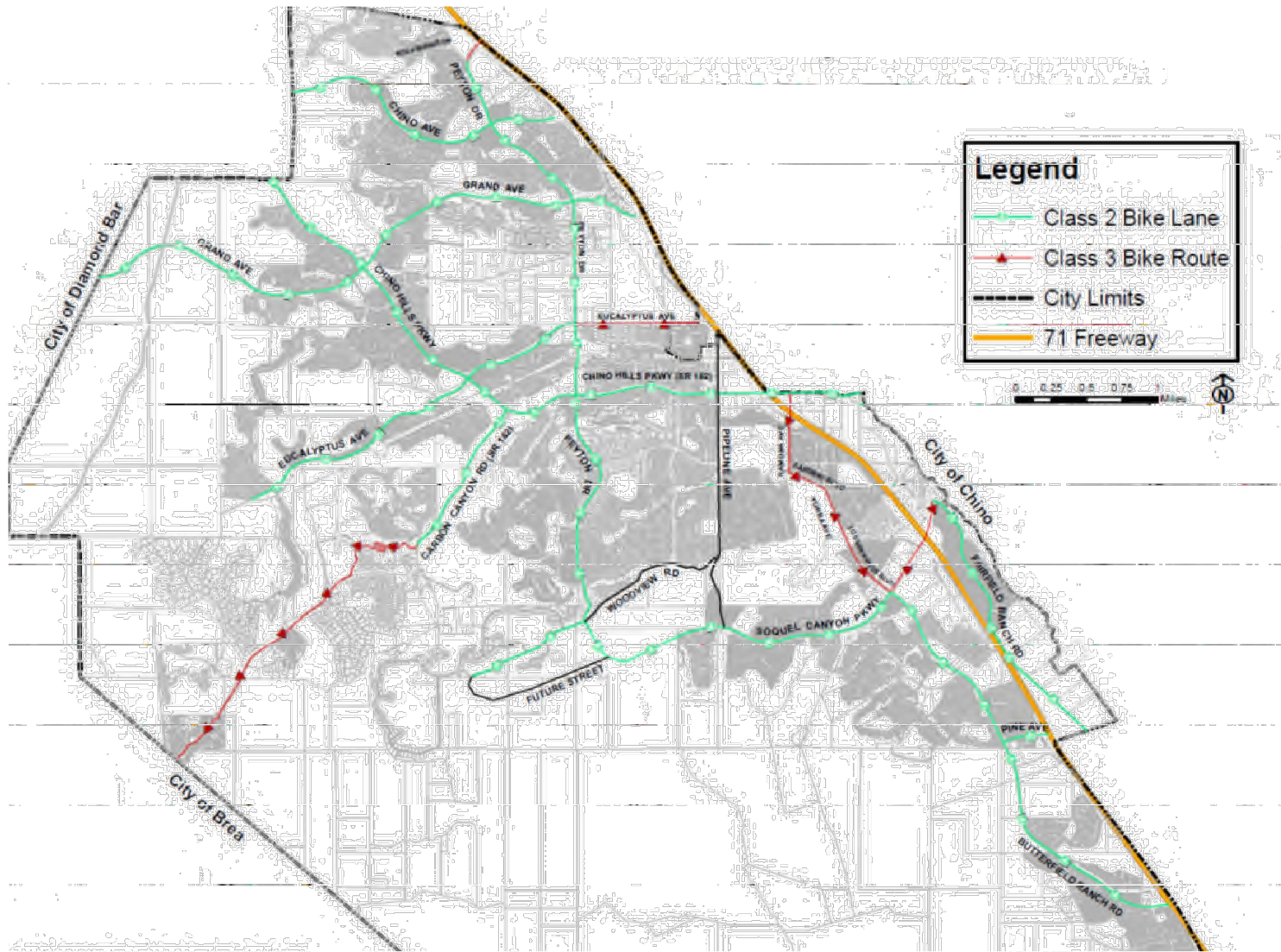
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KEY

- ← = APPROACH LANE ASSIGNMENT
- = TRAFFIC SIGNAL, ▼ = STOP SIGN
- P = PARKING, NP = NO PARKING
- U = UNDIVIDED, D = DIVIDED
- 2 = NUMBER OF TRAVEL LANES
- (XX) = POSTED SPEED LIMIT (MPH)
- OL = OVERLAP
- [Red Hatched Box] = PROJECT SITE

FIGURE 3-1

EXISTING ROADWAY CONDITIONS
AND INTERSECTION CONTROLS
SHADY VIEW PROJECT, CHINO HILLS



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SOURCE: CHINO HILLS GENERAL PLAN

FIGURE 3-2

CHINO HILLS BICYCLE MASTER PLAN
SHADY VIEW PROJECT, CHINO HILLS

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- (1) Year 2020 pre-COVID-19 data is available at the intersection of Butterfield Ranch Road/Pine Avenue (Intersection No. 6). Traffic counts were collected in February 2020 before state-wide “stay at home” orders went into effect. Additionally, Year 2015 historic data is available at the intersection of Shady View Drive/Butterfield Ranch Road (Intersection No. 2).
- (2) Given historic data is not available at the remaining four (4) study locations, Year 2020 COVID-19 weekday AM and PM peak period traffic counts with truck classifications were collected at all six (6) study locations for use in establishing traffic counts/turning movement percentages. Traffic counts were collected in November 2020 by Counts Unlimited. The truck traffic turning movements were converted to passenger car equivalents (P.C.E.’s) using SANBAG approved factors. P.C.E. factors of 1.5, 2.0 and 3.0 were utilized for large 2-axle trucks, 3-axle trucks and 4+-axle trucks, respectively.
- (3) Using information from (1) and (2), compare Year 2020 pre-COVID-19 to Year 2020 COVID-19 to establish change in traffic counts due to current COVID-19 environment for all intersections located along Butterfield Ranch Road.

It is assumed that volume along the residential roadways would not experience as much of a decrease in volume due to COVID-19 when compared to main arterials such as Butterfield Ranch Road. Therefore, using information from (1) and (2), compare Year 2015 to Year 2020 COVID-19 to establish change in traffic counts due to current COVID-19 environment for the intersection of Shady View Drive/Mystic Canyon (Intersection No. 1).

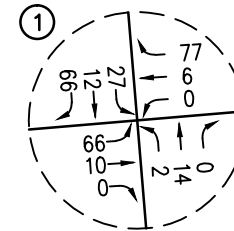
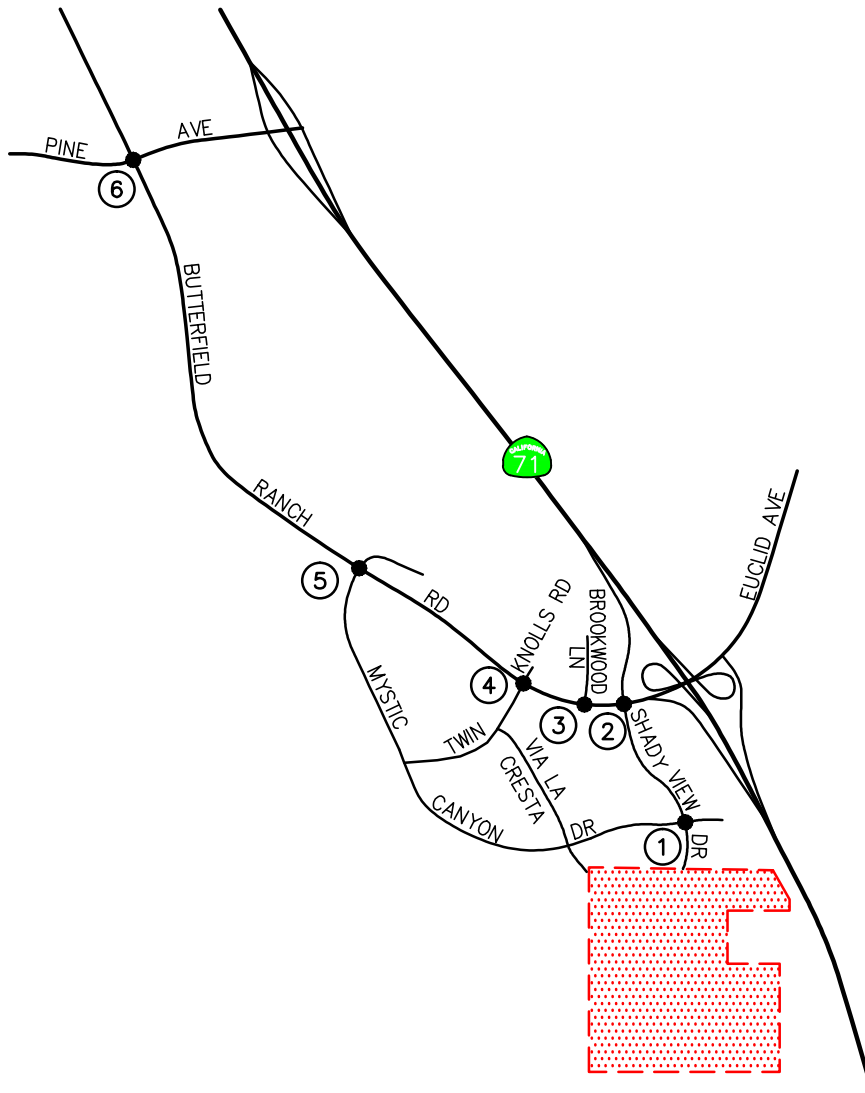
- (4) Apply the rates calculated in (3) to Year 2020 COVID-19 traffic counts and forecast Year 2020 baseline traffic conditions at the missing intersections.
- (5) Lastly, apply an annual growth factor of 2% per year to the Year 2020 baseline traffic conditions to establish Year 2021 baseline traffic conditions.

Figures 3-3 and **3-4** illustrate the Year 2021 existing AM and PM peak hour traffic volumes at the six (6) key study intersections evaluated in this report, respectively.

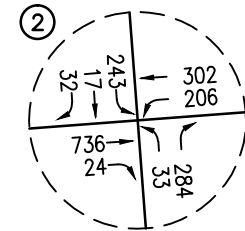
Appendix B contains the summary table for the Year 2021 pre-COVID-19 baseline volume development as well as the detailed peak hour traffic count sheets for the key intersections evaluated in this report.

3.3 Existing Intersection Conditions

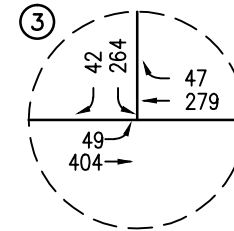
In conformance with each City’s study guidelines and San Bernardino County CMP requirements, existing AM peak hour and PM peak hour operating conditions were evaluated using the methodology outlined in the *Highway Capacity Manual 6th Edition (HCM 6)* for signalized and unsignalized intersections in the City of Chino Hills.



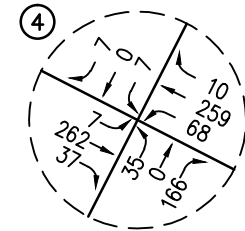
SHADY VIEW DR @
MYSTIC CANYON DR



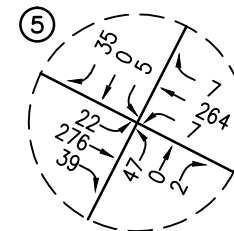
SHADY VIEW DR @
BUTTERFIELD RANCH RD



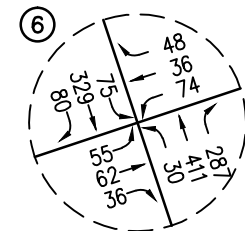
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD

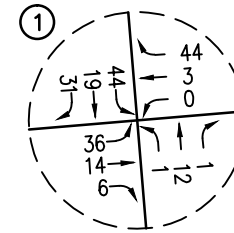
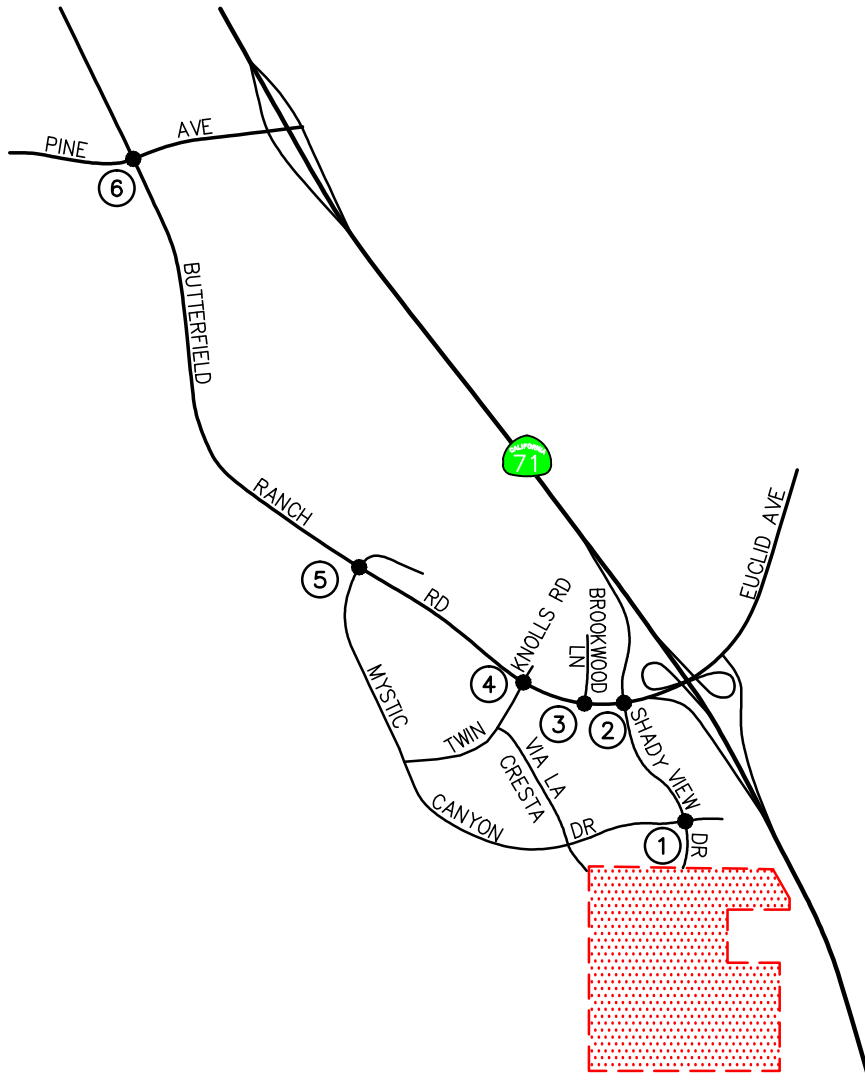


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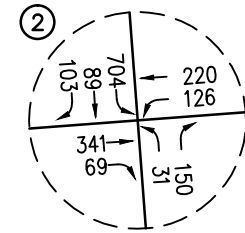


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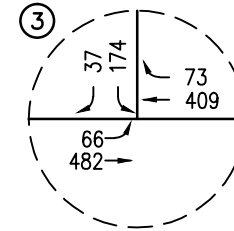
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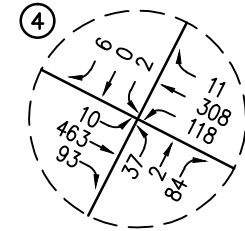
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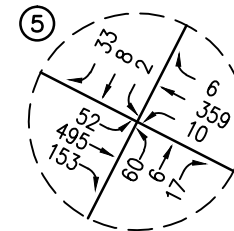
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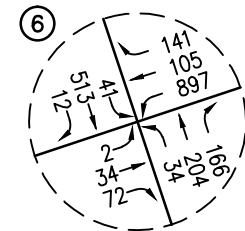
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KEY
= STUDY INTERSECTION
[Red Hatched Box] = PROJECT SITE

FIGURE 3-4

EXISTING PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS

3.3.1 Highway Capacity Manual 6 (HCM6) Method of Analysis (Signalized Intersections)

Based on the HCM operations method of analysis, level of service for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometries, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during ideal conditions: in the absence of traffic control, in the absence of geometric delay, in the absence of any incidents and when there are no other vehicles on the road.

In the HCM, only the portion of total delay attributed to the control facility is quantified. This delay is called *control delay*. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle. The six qualitative categories of Level of Service that have been defined along with the corresponding HCM control delay value range for signalized intersections are shown in **Table 3-1**.

3.3.2 Highway Capacity Manual 6 (HCM 6) Method of Analysis (Unsignalized Intersections)

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each movement. For all-way stop controlled intersections, the overall average control delay measured in seconds per vehicle and level of service is then calculated for the entire intersection. For one-way and two-way stop-controlled (minor street stop-controlled) intersections, this methodology estimates the worst side street delay, measured in seconds per vehicle and determines the level of service for that approach. The HCM control delay value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in **Table 3-2**.

**TABLE 3-1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM 6)¹**

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	LOS A describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume –to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	> 10.0 and ≤ 20.0	LOS B describes operations with a control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume –to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
C	> 20.0 and ≤ 35.0	LOS C describes operations with a control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual <i>cycle failures</i> (i.e. one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	LOS D describes operations with a control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	LOS E describes operations with a control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable and the cycle length is long. Individual cycle failures are frequent.
F	≥ 80.0	LOS F describes operations with a control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor and the cycle length is long. Most cycles fail to clear the queue.

¹ Source: *Highway Capacity Manual 6th Edition*, Chapter 19 (Signalized Intersections).

TABLE 3-2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS²

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

² Source: *Highway Capacity Manual 6th Edition*, Chapter 20: Two-Way Stop-Controlled Intersections and Chapter 21: All-Way Stop-Controlled Intersections.

3.3.3 Level of Service and Traffic Impact Criteria

Chino Hills

According to the City of Chino Hills guidelines, a significant traffic impact occurs when the intersections or roadway projected to operate at LOS D or better without the Project would exceed LOS D with the Project. Significant traffic impact is also considered to occur if the Project results in an increase of 0.01 or more in the volume-to-capacity (V/C) ratio at a location that is projected to operate at LOS E or F without the Project.

3.3.4 Existing Level of Service Results

Table 3-3 summarizes the existing peak hour service level calculations for the six (6) key study intersections based on existing traffic volumes and current street geometry. Review of **Table 3-3** indicates that the six (6) key study intersections currently operate at an acceptable level of service during the AM and PM peak hours.

Appendix C presents the Delay/LOS calculation worksheets for the key study intersections.

**TABLE 3-3
EXISTING PEAK HOUR LEVELS OF SERVICE**

Key Intersections	Time Period	City/ Jurisdiction	Control Type	Delay (sec/veh)	V/C Ratio	LOS
1. Shady View Drive at Mystic Canyon Drive	AM	Chino Hills	All-Way	7.8	0.151	A
	PM		Stop	7.6	0.142	A
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	Chino Hills/	4Ø Traffic	38.9	0.715	D
	PM	Caltrans	Signal	46.1	0.619	D
3. Brookwood Lane at Butterfield Ranch Road	AM	Chino Hills	3Ø Traffic	15.4	0.344	B
	PM		Signal	11.0	0.326	B
4. Twin Knolls Drive at Butterfield Ranch Road	AM	Chino Hills	Two-Way	14.3	0.030	B
	PM		Stop	23.0	0.013	C
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	Chino Hills	2Ø Traffic	36.5	0.153	D
	PM		Signal	30.4	0.303	C
6. Butterfield Ranch Road at Pine Avenue	AM	Chino Hills	8Ø Traffic	17.9	0.360	B
	PM		Signal	33.6	0.600	C

Note:

- **LOS values** indicate adverse service levels based on City LOS standards.
- LOS = Level of Service, please refer to *Tables 3-1* and *3-2* for the LOS definitions.
- Ø = Phase

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the Project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound Project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of Project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and Project traffic assignments developed, the impact of the proposed Project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast Project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the Project's impacts identified based on the criteria outlined in the *Traffic Impact Study Guidelines for Development Projects in the City of Chino Hills (dated 10/15/01)*.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Trip Generation

Trip generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017]*.

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and presents the Project's forecast peak hour and daily traffic volumes. As shown in upper portion of *Table 5-1*, the trip rates for ITE Land Use 210: Single-Family Detached Housing are presented.

A review of the lower portion of *Table 5-1* indicates that the proposed Project is forecast to generate 1,501 weekday daily trips (one half arriving, one half departing), with 118 trips (30 inbound, 88 outbound) produced during the AM peak hour and 157 trips (99 inbound, 58 outbound) produced during the PM peak hour.

5.2 Project Trip Distribution and Assignment

Figure 5-1 illustrates the general, directional traffic distribution pattern for the proposed Project. Project traffic volumes both entering and exiting the Project site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site's proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity,
- ingress/egress availability at the Project site and
- input from City staff and approval of Scope of Work, inclusive of the Project's trip distribution pattern.

The anticipated AM and PM peak hour traffic volumes associated with the proposed Project are presented in **Figures 5-2** and **5-3**, respectively. The traffic volume assignments presented in **Figures 5-2** and **5-3** reflect the traffic distribution characteristics shown in *Figure 5-1* and the traffic generation forecast presented in the lower portion of *Table 5-1*.

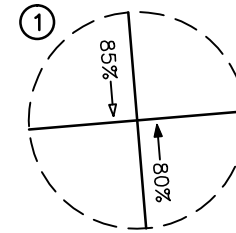
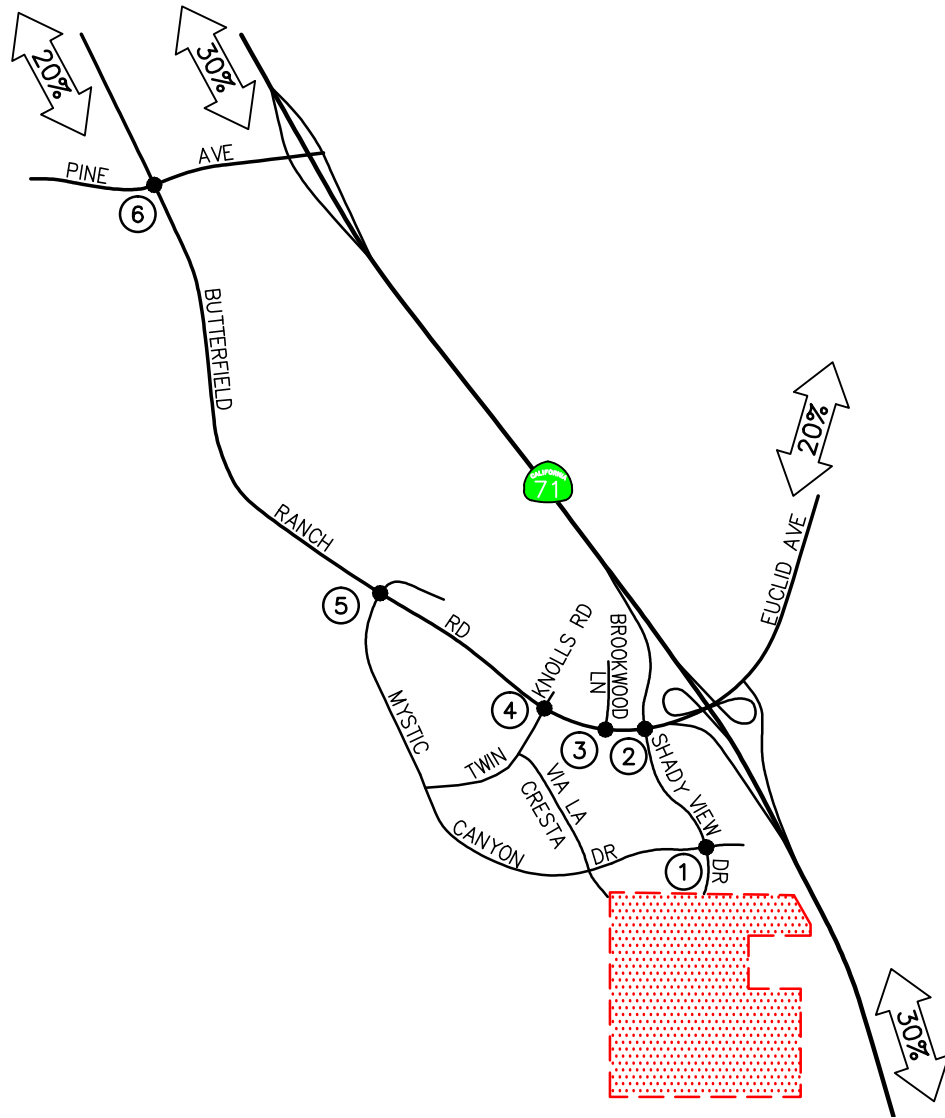
TABLE 5-1
PROJECT TRIP GENERATION RATES AND FORECAST³

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<u>Trip Generation Rates:</u>							
▪ 210: Single-Family Detached Housing (TE/DU)	9.44	25%	75%	0.74	63%	37%	0.99
<u>Project Trip Generation Forecast:</u>							
▪ Single-Family Homes (159 DU)	1,501	30	88	118	99	58	157

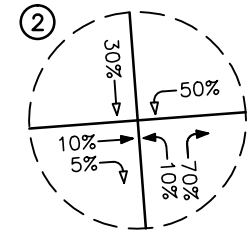
Notes:

- TE/DU = Trip End per Dwelling Unit

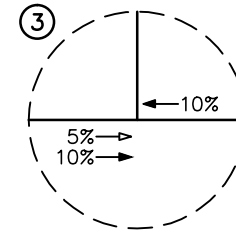
³ Source: *Trip Generation*, 10th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2017).



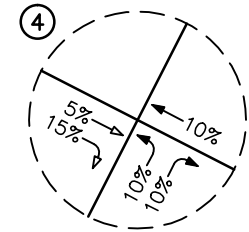
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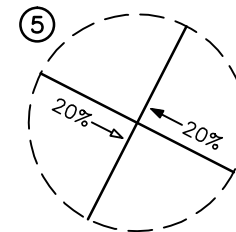
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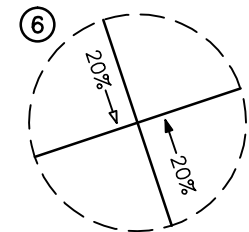
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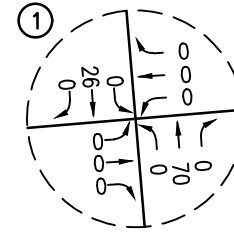
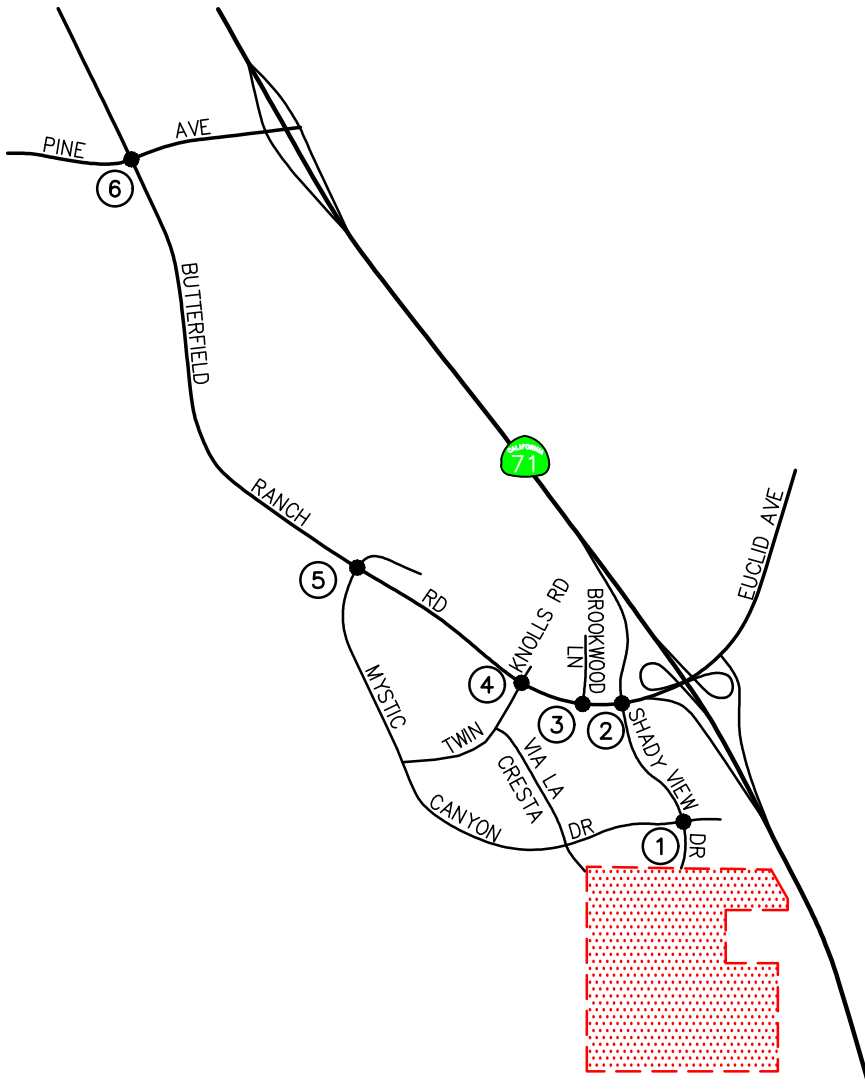


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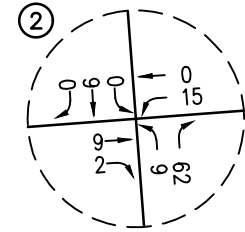
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- ↖ = INBOUND PERCENTAGE
- ↗ = OUTBOUND PERCENTAGE
- ▨ = PROJECT SITE

FIGURE 5-1

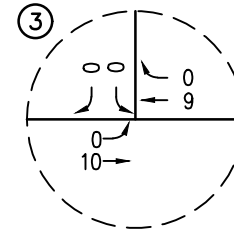
PROJECT TRIP DISTRIBUTION PATTERN
SHADY VIEW PROJECT, CHINO HILLS



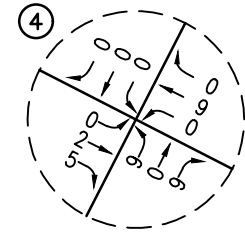
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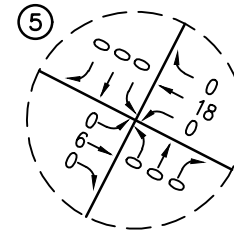
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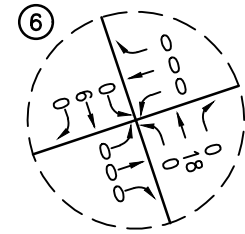
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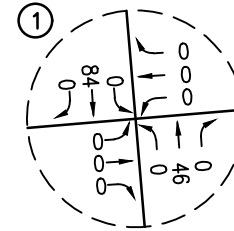
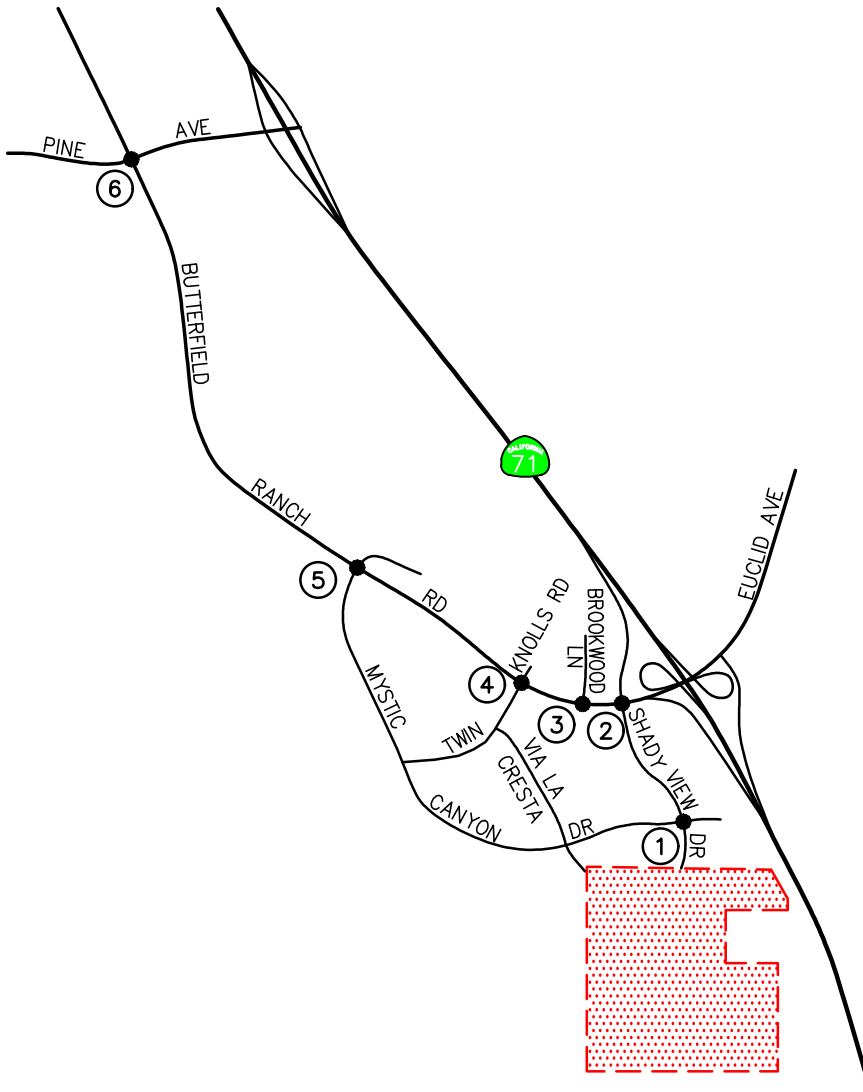
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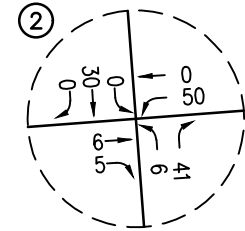
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FIGURE 5-2

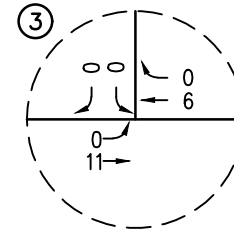
AM PEAK HOUR PROJECT ONLY TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



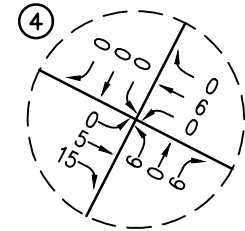
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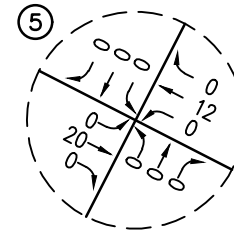
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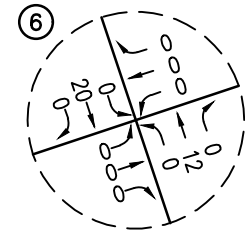
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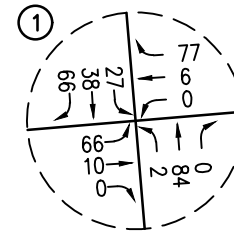
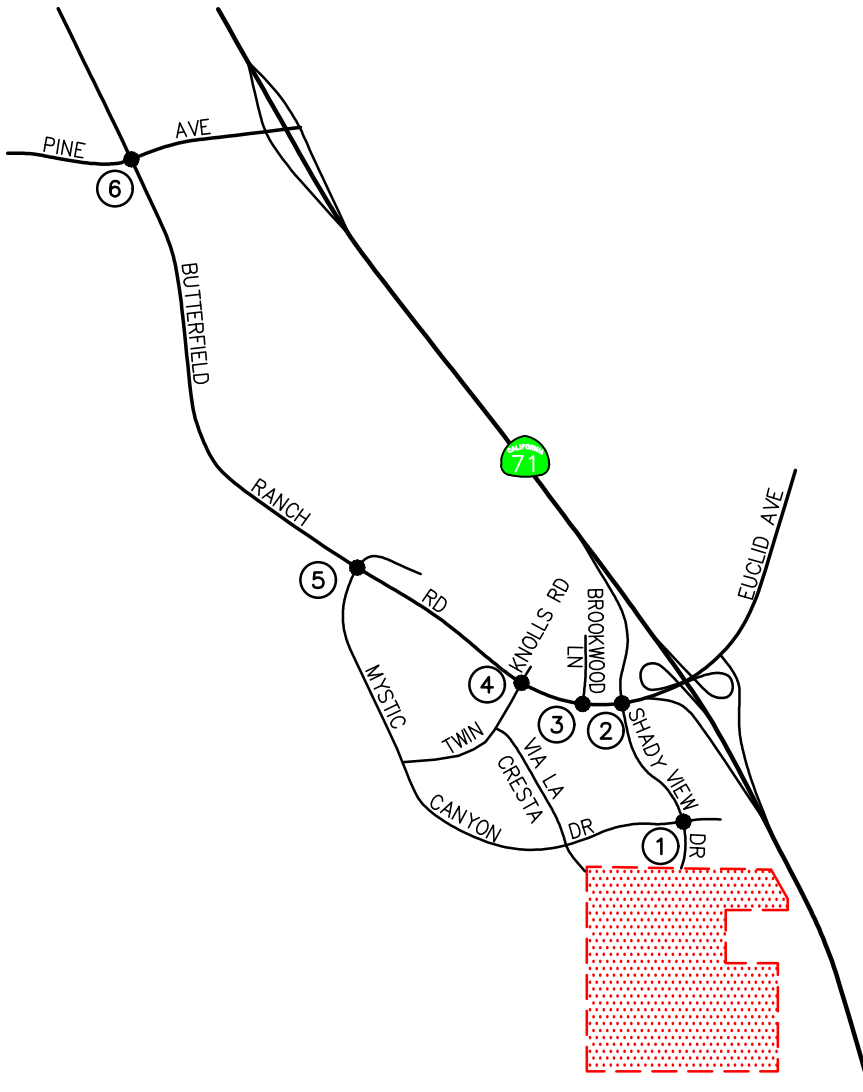
FIGURE 5-3

PM PEAK HOUR PROJECT ONLY TRAFFIC VOLUMES
 SHADY VIEW PROJECT, CHINO HILLS

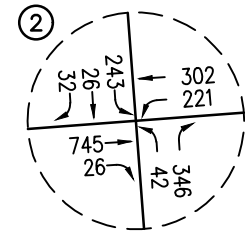
5.3 Existing With Project Traffic Conditions

The Existing With Project traffic conditions have been generated based upon existing conditions and estimated traffic generated from the proposed Project. These forecast traffic conditions have been prepared to assess the potential impacts of a Project upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to off-set the direct traffic impacts of the Project, if any.

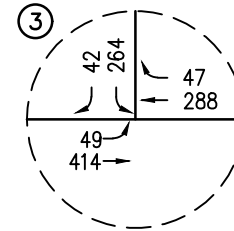
Figures 5-4 and 5-5 present projected AM and PM peak hour traffic volumes at the six (6) key study intersections with the addition of the trips generated by the proposed Project to existing traffic volumes, respectively.



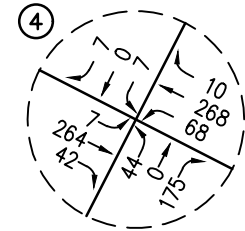
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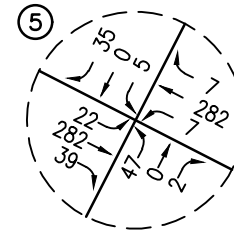
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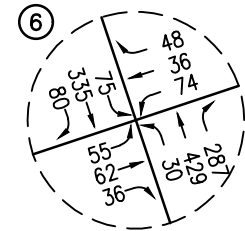
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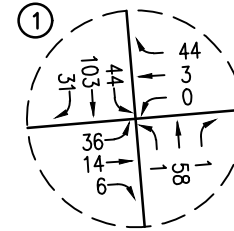
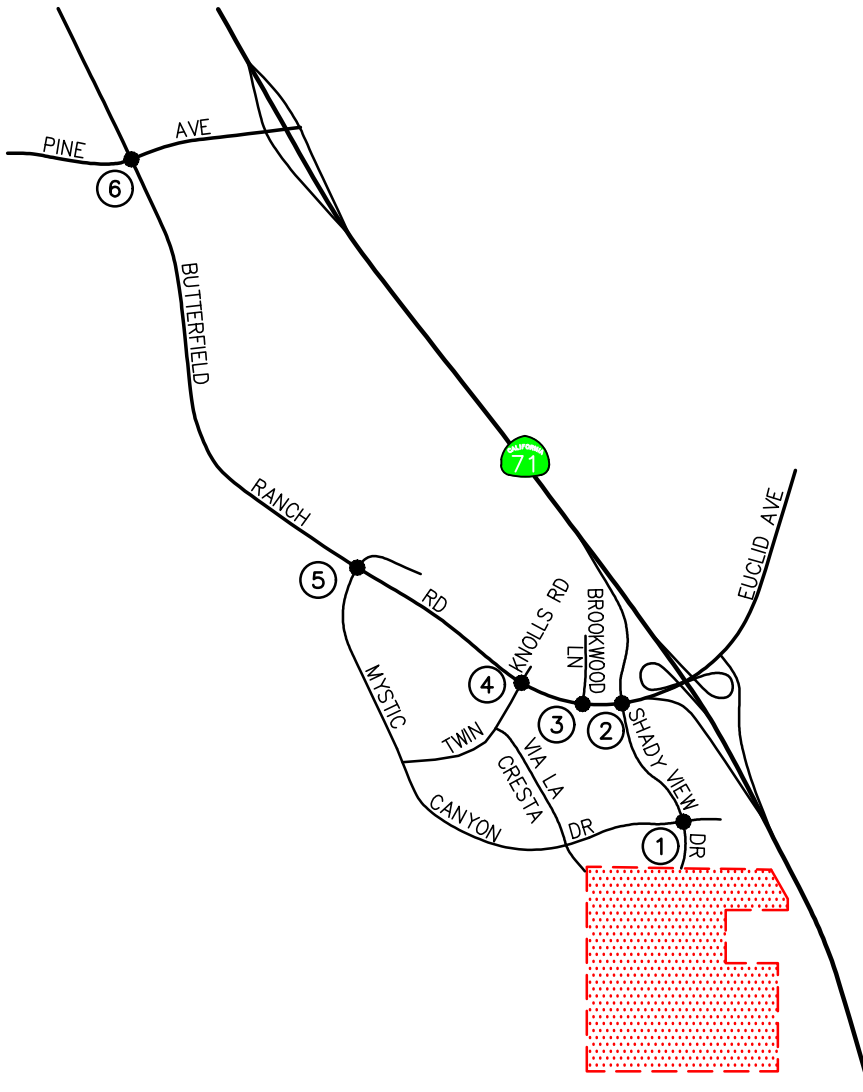
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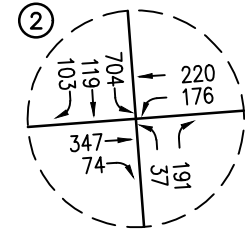
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FIGURE 5-4

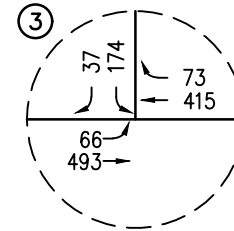
EXISTING WITH PROJECT AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



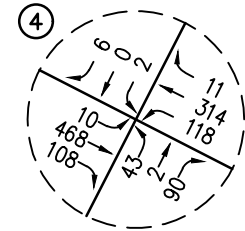
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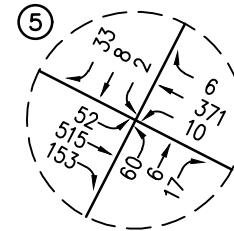
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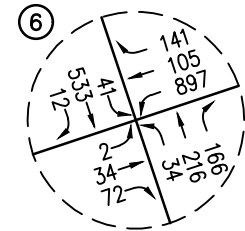
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FIGURE 5-5

EXISTING WITH PROJECT PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Ambient Traffic Growth

Horizon year, background traffic growth estimates have been calculated using an ambient growth factor. The ambient traffic growth factor is intended to include unknown and future related projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area in other jurisdictions. The future growth in traffic volumes has been calculated at two percent (2%) per year. Applied to the Year 2021 existing traffic volumes, this factor results in a 6% growth in existing volumes to the near-term horizon Year 2024.

6.2 Cumulative Projects Description and Location

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (cumulative projects) in the vicinity of the proposed Project has been researched at the City of Chino Hills and City of Chino. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development. Based on our research, there are seventeen (17) cumulative projects in the City of Chino Hills and six (6) cumulative projects in the City of Chino within the vicinity of the subject site. These twenty-three (23) cumulative projects have been included as part of the cumulative background setting.

Table 6-1 provides the location and a brief description for each of the twenty-three (23) cumulative projects. *Figure 6-1* graphically illustrates the location of the cumulative projects. These cumulative projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections.

6.3 Cumulative Projects Trip Generation and Assignment

Table 6-2 summarizes the trip generation rates for the various land uses of the twenty-three (23) cumulative projects. *Table 6-3* presents the trip generation potential for all twenty-three (23) cumulative projects. As shown, the cumulative projects are forecast to generate a total of 27,105 daily trips, with 1,510 trips (799 inbound and 711 outbound) forecast during the AM peak hour and 2,241 trips (1,100 inbound and 1,141 outbound) forecast during the PM peak hour.

Distribution patterns for each of the cumulative projects were developed based on the location of the trip attractors, type of land use, the site's proximity to major traffic carriers and freeways and previously completed traffic studies. The AM and PM peak hour traffic volumes associated with the twenty-three (23) cumulative projects in Year 2024 are presented in *Figures 6-2* and *6-3*, respectively.

**TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS⁴**

No.	Cumulative Project	Location/Address	Description
City of Chino Hills			
1.	Country Club Villas	On Pomona Rincon Road between Wallace Ave and Los Serranos Road	70 DU condominium project <i>Built/Occupied:</i> Phase 1: 24 DU condominiums <i>Built/Partially occupied:</i> Phase 2: 28 DU condominiums <i>Entitled/To Be Constructed:</i> Phase 3: 18 DU condominiums
2.	Lago Los Serranos	Southwest corner of Ramona Avenue and Bird Farm Road	95 DU condominium project <i>Built/Partially Occupied:</i> 69 DU condominiums <i>Under Construction:</i> 26 DU condominiums
3.	Vila Borba	West and east of Butterfield Ranch Road near Pine Avenue	<i>Entitled:</i> Tract 16413 19 DU single family <i>Entitled:</i> Tract 16414 ⁵ - 280 DU multifamily units and 5-acre commercial center
4.	The Reserve at Chino Hills	Reserve at Chino Hills Apartment Complex	<i>Proposed/Under Review:</i> 42 DU multifamily
5.	The Commons	South of Chino Hills Parkway, east of Ramona Avenue and north of SR-71	533,675 SF existing shopping center <i>Built/Unoccupied:</i> 63,300 SF of floor area for Anchor tenant <i>Entitled/Unbuilt:</i> 53,500 SF of floor area
6.	Crossroads Entertainment Center	Northwest of Chino Avenue and SR-71	<i>Entitled/Under Construction:</i> 4,050 SF multi-tenant building consisting of 2,258 SF Burger King with drive thru and 1,792 SF retail/restaurant tenant space
7.	Stonefield Development	Northwest of Carbon Canyon Road and east of Fairway Drive	<i>Entitled:</i> 28 DU single-family
8.	Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum	South of Morningfield Drive, west of Peyton Drive, north of Chino Hills Parkway, adjacent to San Bernardino County Flood Channel	<i>Entitled:</i> 7-Lot Subdivision with semi-custom single-family homes, plus 3 classrooms/71 student addition to the Lutheran School
9.	Coptic Orthodox Church	East side of Peyton Drive, north of the Chino Creek Drainage Channel and south of the Chino Valley Community Church property	<i>Entitled:</i> 14,695 SF multi-purpose room, 8,645 SF Sanctuary and 555 SF Bookstore
10.	Buddhist Temple of Chino Hills	Northeast of Chino Hills Parkway and Rustic Drive	<i>Entitled:</i> 23,400 SF Buddhist temple expansion
11.	Goddard School	South of Pomona Rincon Road and east of Picasso Drive	<i>Entitled/Under Construction:</i> 10,587 SF childcare facility/pre-school with two outdoor play areas; 9 classrooms with a capacity of 180 students and 22 employees

⁴ Source: *City of Chino Hills Community Development Department*. and research at the City of Chino, inclusive of review of recent traffic impact studies.

⁵ Note, this Planning Area is proposed to be modified and developed with 220 DU multifamily units, however for the purposes of this analysis, the existing entitlement, which is larger, is used in the cumulative analysis.

TABLE 6-1 (CONTINUED)
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS⁶

No.	Cumulative Project	Location/Address	Description
City of Chino Hills (Continued)			
12.	Paradise Ranch (T20286)	Canyon Hills Road, north of Hillcrest Development	<i>Proposed/Under Review:</i> 52 DU Single Family
13.	Rancho Cielito	48.37 acres is generally located north of Los Serranos Boulevard, south of Lakeview Drive and east of Pipeline Avenue	<i>Proposed/Under Review:</i> 354 residential apartment units, consisting of seven (7) two-story and seven (7) three-story residential carriage buildings, ten (10) three-story residential buildings and two (2) clubhouses.
14.	The Rincon	Southwest corner of Soquel Canyon Parkway and State Route 71	<i>Entitled:</i> 70,000 SF, 4-story, 119-room Hotel (Holiday Inn Express) - Construction plans approved.
15.	Storage District	Vacant pad in Fairfield Ranch Business Park (to the northeast of the Chino Hills Hotel)	<i>Entitled/Under Construction:</i> 130,139-square foot self-storage facility, including a 2,000-square foot guest lobby and business service area; Construction to start in late 2019/early 2020
16.	Hidden Oaks	East of Carbon Canyon Road at Canyon Hills Road	<i>Proposed:</i> 53 DU Single Family
17.	Chino Hills Biz Park (formerly Heritage Professional Center)	Pomona Rincon Road (south of The Rincon)	<i>Proposed/Under Review:</i> 113,500 SF office building, 23,000 SF warehouse building, 120-room hotel, and 19,000 SF retail/commercial space.
City of Chino			
18.	PL10-0726	Southeast corner of Shaefer Avenue and Central Avenue	13,672 sq. ft. Offices
19.	Chaffey College Expansion	Generally located south of College Park Avenue and west of Eucalyptus Avenue	93.5 acres Junior/Community College
20.	College Park Commercial	Generally located south of College Park Avenue and west of Eucalyptus Avenue	7.5 acres Commercial Park
21.	Kamway (PL 14-0929)	Northeast corner of Shaefer Avenue and Central Avenue	21,572 sq. ft. Industrial building
22.	Henry Hong (PL 15-0490)	Northeast corner of Shaefer Avenue and Central Avenue	62,200 sq. ft. Industrial building
23.	Fairfield Inn & Suites	Southwest corner of Yorba Avenue and Eucalyptus Avenue	111 room Hotel

⁶ Source: *City of Chino Hills Community Development Department*. and research at the City of Chino, inclusive of review of recent traffic impact studies.

TABLE 6-2
TRIP GENERATION RATES APPLIED TO CUMULATIVE PROJECTS⁷

ITE Land Use Code	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
▪ 110: General Light Industrial (TE/1000 SF)	4.96	88%	12%	0.70	13%	87%	0.63
▪ 151: Mini Warehouse (TE/1000 SF)	1.51	60%	40%	0.10	47%	53%	0.17
▪ 210: Single Family Detached (TE/DU)	9.44	25%	75%	0.74	63%	37%	0.99
▪ 220: Multifamily Housing Low Rise (TE/DU)	7.32	23%	77%	0.46	63%	37%	0.56
▪ 310: Hotel (TE/Room)	8.36	59%	41%	0.47	51%	49%	0.60
▪ 495: Recreational Community Center (TE/1000 SF) ⁸	33.82	66%	34%	2.05	49%	51%	2.74
▪ 540: Junior Community College (TE/1000 SF)	20.25	77%	23%	2.07	50%	50%	1.86
▪ 560: Church (TE/1000 SF) ⁸	9.11	62%	38%	0.56	48%	52%	0.55
▪ 710: General Office Building (TE/1000 SF)	9.74	86%	14%	1.16	16%	84%	1.15
▪ 820: Shopping Center (TE/1000 SF)	37.75	62%	38%	0.94	48%	52%	3.81
▪ 934: Fast Food Restaurant with Drive Through Window (TE/1000 SF)	470.95	51%	49%	40.19	52%	48%	32.67

⁷ Unless otherwise noted, source: *Trip Generation, 10th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2017)].

⁸ Source: *Trip Generation, 9th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2012)].

**TABLE 6-3
CUMULATIVE PROJECTS TRIP GENERATION FORECAST⁹**

Cumulative Project Description	Daily Two-Way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
City of Chino Hills							
1. Country Club Villas	132	2	6	8	6	4	10
2. Lago Los Serranos	190	3	9	12	9	6	15
3. Vila Borba	5,189	80	137	217	216	179	395
4. The Reserve at Chino Hills ¹⁰	307	4	15	19	15	9	24
5. The Commons	3,968	61	38	99	141	153	294
6. Crossroads Entertainment Center	1,025	24	24	48	22	22	44
7. Stonefield Development	267	5	16	21	18	10	28
8. Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum ¹¹	264	36	33	69	24	26	50
9. Coptic Orthodox Church	581	23	12	35	22	23	45
10. Buddhist Temple of Chino Hills ¹²	200	7	5	12	6	6	12
11. Goddard School ¹³	788	76	68	144	69	77	146
12. Paradise Ranch (T20286)	491	10	28	38	32	19	51
13. Rancho Cielito ¹⁴	2,591	37	125	162	125	73	198
14. The Rincon	995	33	23	56	36	35	71
15. Storage District	197	8	5	13	10	12	22
16. Hidden Oaks	500	10	29	39	33	19	52
17. Chino Hills Biz Park ¹⁵	2,794	160	48	208	81	173	254
City of Chino							
18. PL10-0726	133	14	2	16	3	13	16
19. Chaffey College Expansion	709	55	17	72	33	32	65
20. College Park Commercial	4,440	68	43	111	158	171	329
21. Kamway (PL 14-0929)	107	13	2	15	2	12	14
22. Henry Hong (PL 15-0490)	309	39	5	44	5	34	39
23. Fairfield Inn & Suites	928	31	21	52	34	33	67
Total Cumulative Projects Net Trip Generation Forecast	27,105	799	711	1,510	1,100	1,141	2,241

⁹ Unless otherwise noted, source: *Trip Generation, 10th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2017)].

¹⁰ Source: *The Reserve at Chino Hills TIA Report*, prepared by LLG Engineers in April 2020.

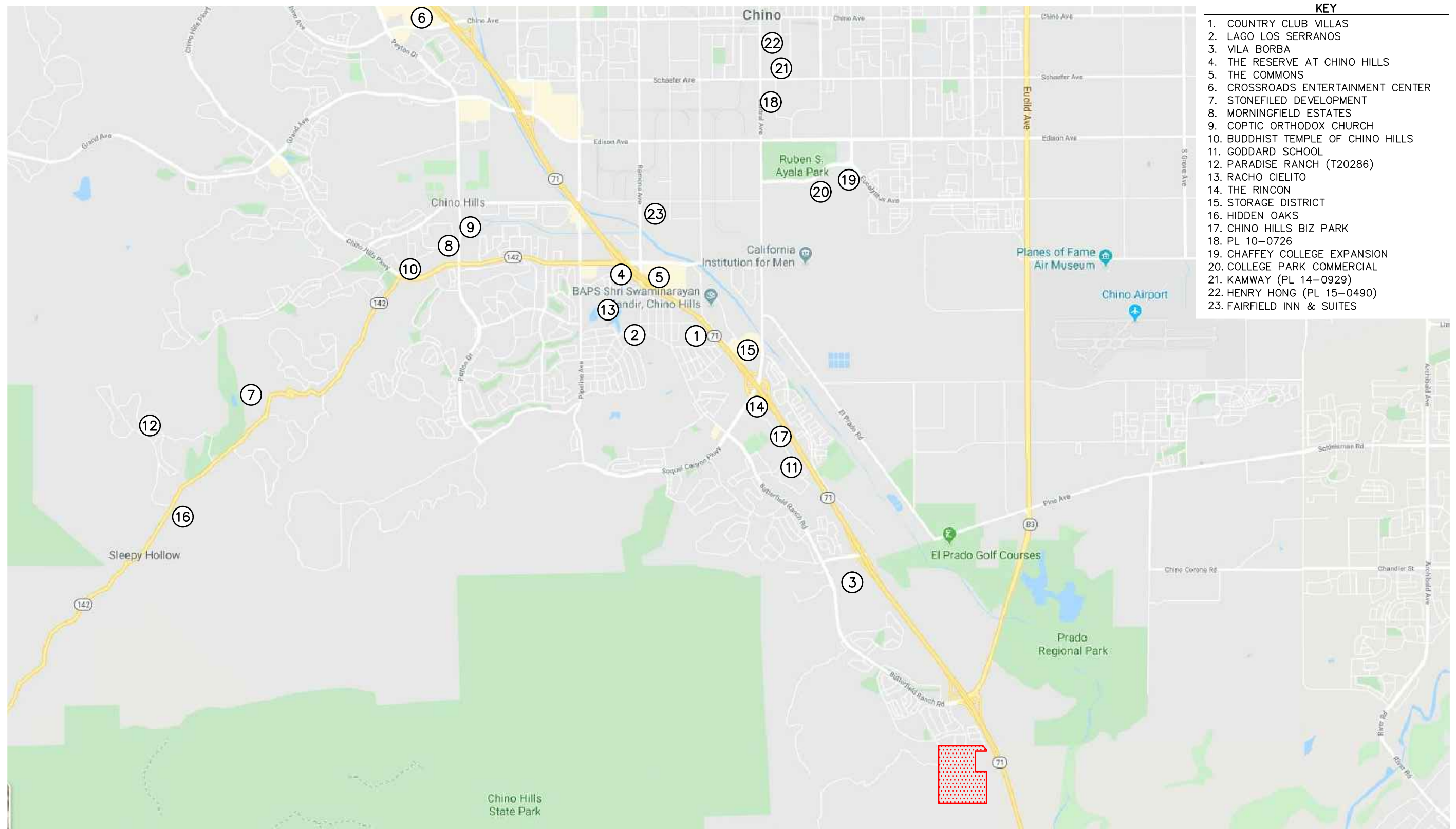
¹¹ Source: *Morningfield Estates and Loving Savior of the Hills Lutheran Church and School Master Plan Addendum TIA Report*, prepared by LLG Engineers in October 2016 (Revised April 2017).

¹² Source: *Buddhist Temple TIA Report*, prepared by LLG Engineers in December 2016 (Revised January 2017).

¹³ Source: *Goddard Preschool TIA Report*, prepared by LLG Engineers in December 2017.

¹⁴ Source: *Rancho Cielito TIA Report*, prepared by LLG Engineers in April 2020.

¹⁵ Source: *Chino Hills Biz Park TIA Report*, prepared by LLG Engineers in May 2020 (Revised June 2020).



- KEY**
1. COUNTRY CLUB VILLAS
 2. LAGO LOS SERRANOS
 3. VILA BORBA
 4. THE RESERVE AT CHINO HILLS
 5. THE COMMONS
 6. CROSSROADS ENTERTAINMENT CENTER
 7. STONEFILED DEVELOPMENT
 8. MORNINGFIELD ESTATES
 9. COPTIC ORTHODOX CHURCH
 10. BUDDHIST TEMPLE OF CHINO HILLS
 11. GODDARD SCHOOL
 12. PARADISE RANCH (T20286)
 13. RACHO CIELITO
 14. THE RINCON
 15. STORAGE DISTRICT
 16. HIDDEN OAKS
 17. CHINO HILLS BIZ PARK
 18. PL 10-0726
 19. CHAFFEY COLLEGE EXPANSION
 20. COLLEGE PARK COMMERCIAL
 21. KAMWAY (PL 14-0929)
 22. HENRY HONG (PL 15-0490)
 23. FAIRFIELD INN & SUITES

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SOURCE: GOOGLE

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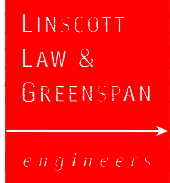
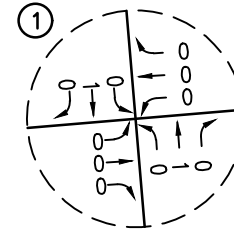
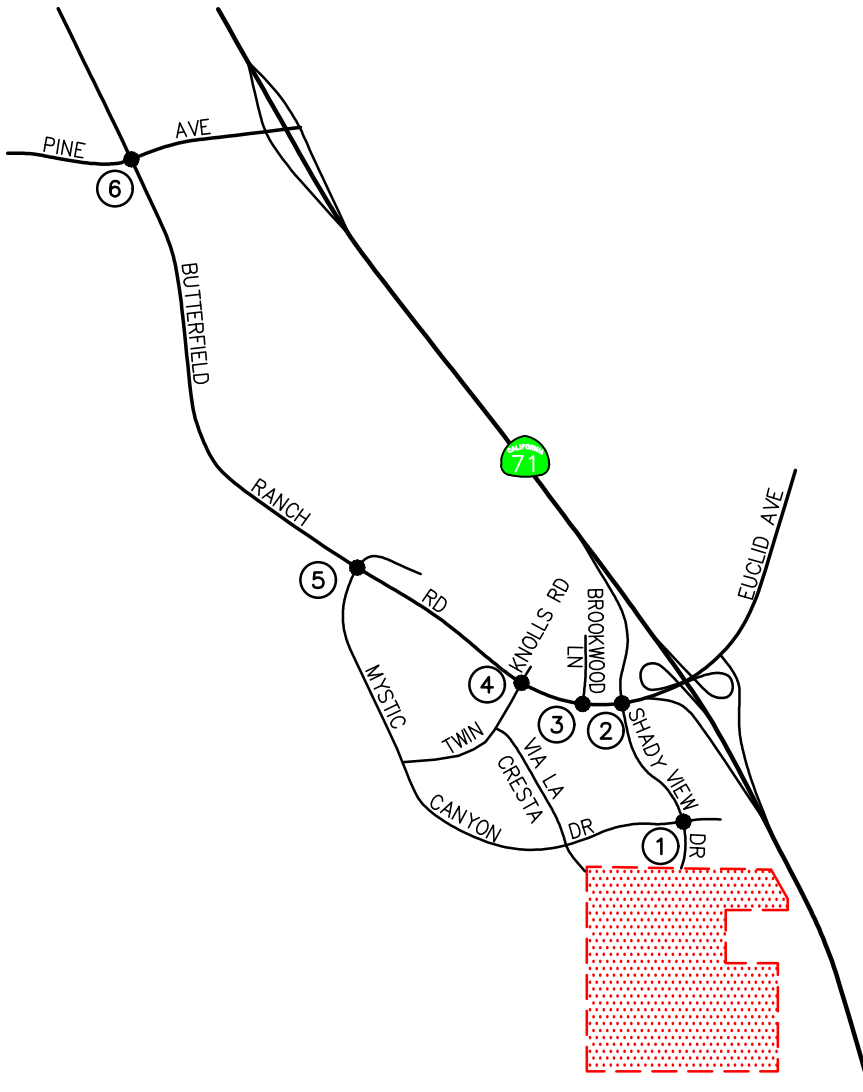
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-  = PROJECT SITE

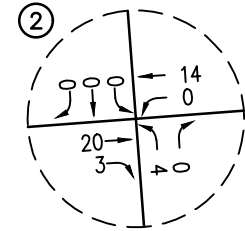
FIGURE 6-1

CUMULATIVE PROJECTS LOCATION MAP
SHADY VIEW PROJECT, CHINO HILLS

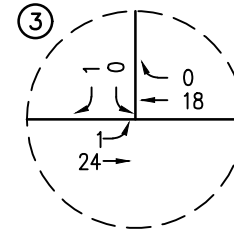




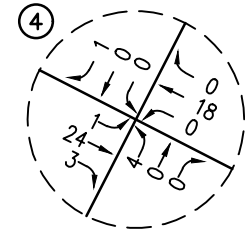
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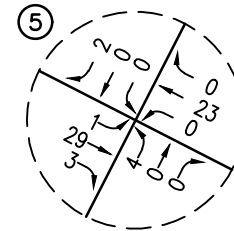
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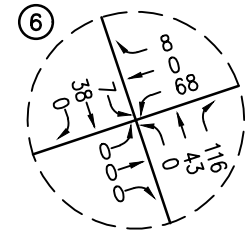
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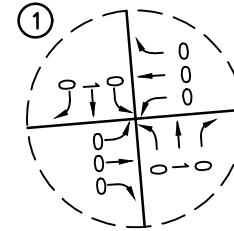
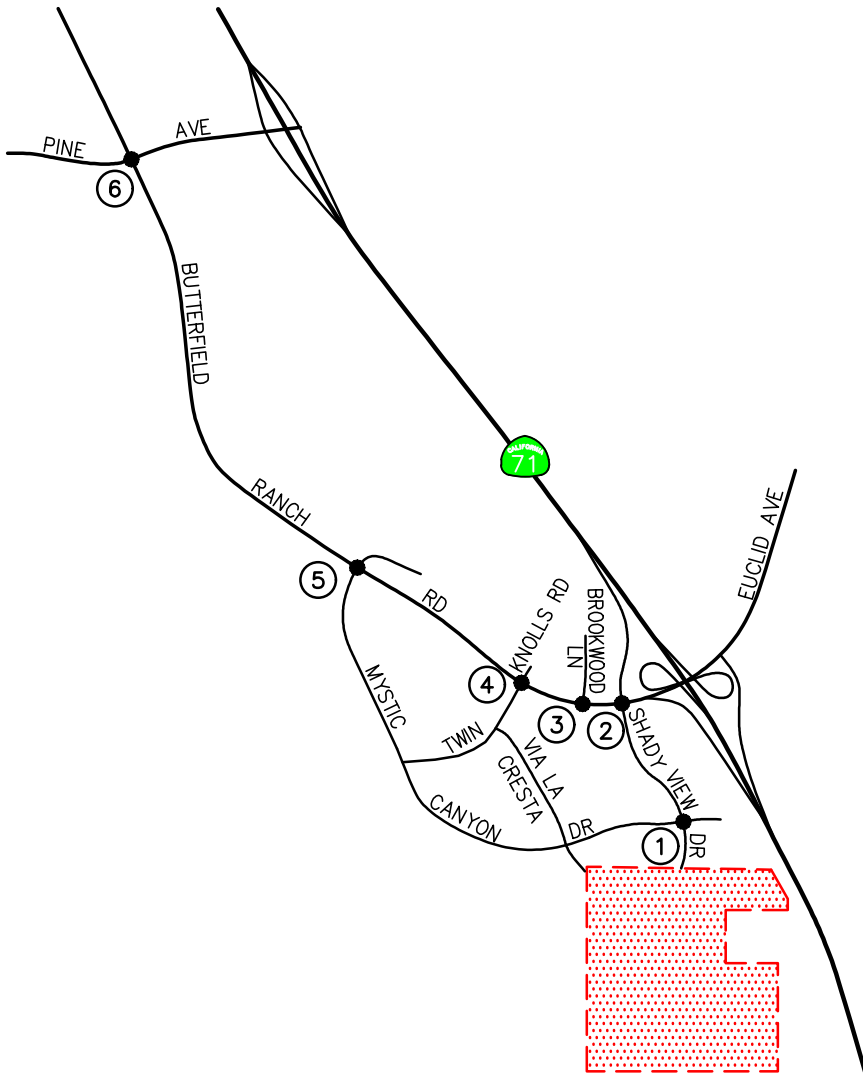
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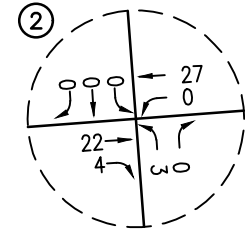
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FIGURE 6-2

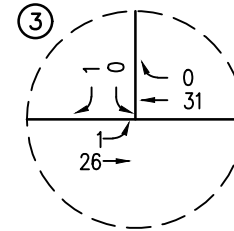
AM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



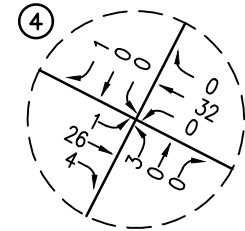
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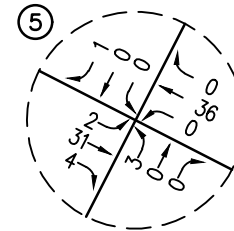
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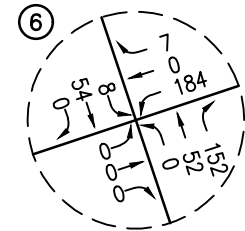
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FIGURE 6-3

PM PEAK HOUR CUMULATIVE PROJECT TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS

6.4 Year 2024 Traffic Volumes

Figures 6-4 and 6-5 present the Year 2024 Without Project AM and PM peak hour cumulative traffic volumes at the six (6) key study intersections, respectively. Please note that the cumulative traffic volumes represent the accumulation of existing traffic, ambient growth traffic and cumulative projects traffic.

Figures 6-6 and 6-7 illustrate the Year 2024 forecast AM and PM peak hour traffic volumes with the inclusion of the trips generated by the proposed Project, respectively.

6.5 Year 2040 Traffic Conditions

Long-term (Year 2040) traffic volume forecasts for this traffic analysis were determined through utilization of the San Bernardino Traffic Analysis Model (SBTAM) developed by SANBAG. The future Year 2040 traffic volumes were post-processed based on the relationship of Year 2016 base year validation model run output to the base year ground traffic counts. The projected volume was reviewed carefully and adjustments were applied as warranted based on local conditions and professional judgment. Copies of the traffic model post-processing worksheets for Year 2040 are contained in *Appendix D*.

6.5.1 Volume Adjustment

Using the SBTAM, projected traffic volumes were obtained for each intersection. The first step is to obtain the approach and departure volumes from the model for each leg of the analyzed intersections. The next step is to determine the difference between the base year peak hour model volumes and the build-out peak hour model volumes. This “difference” represents the projected growth in traffic on each approach from the base year to the build-out using the SBTAM.

6.5.2 B-turn Methodology

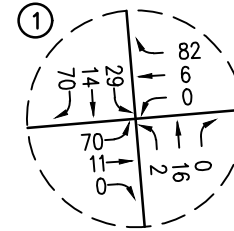
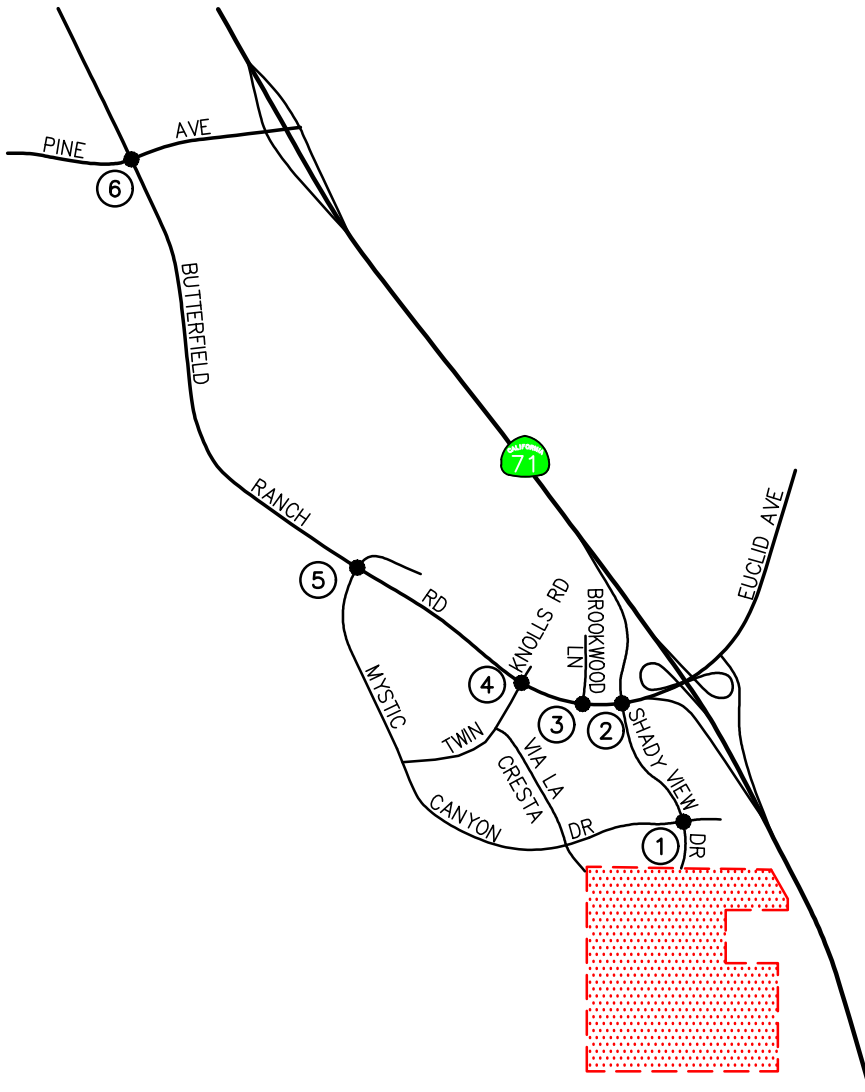
The base year turning movement counts for each intersection must be converted to approach and departure volumes for each leg of the intersection. Once the base counts are in this format, the difference between the build-out model and base model are then added to the base year counts for each corresponding approach and departure volume. This step provides the adjusted volumes that will be used to determine the build-out turning movement volumes. The next process in the forecasting of future turning volumes applies the B-turn methodology. The B-turn methodology is generally described in the “*National Cooperative Highway Research Program Report (NCHRP) 255: Highway Traffic Data for Urbanized Area Project Planning and Design*”, Chapter 8. The B-turn method uses the base year turning percentages (from traffic counts) and proceeds through an iterative computational technique to produce a final set of future year turning volumes. The computations involve alternatively balancing the rows (approaches) and the columns (departures) of a turning movement matrix until an acceptable convergence is obtained. Future year link volumes are fixed using this method and the turning movements are adjusted to match. The results must be checked for reasonableness and manual adjustments are sometimes necessary.

Projected volumes were reviewed carefully and adjustments were applied as warranted based on local conditions and professional engineering judgment. Please note that the post-processing methodology utilized in this report is consistent with SCAG/SANBAG requirements.

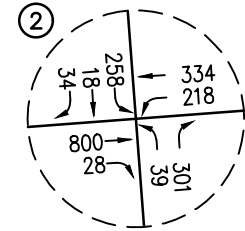
6.6 Year 2040 Traffic Volumes

The anticipated AM and PM peak hour traffic volumes, at the key study intersections, associated with Year 2040 Without Project traffic conditions are presented in *Figures 6-8* and *6-9*, respectively.

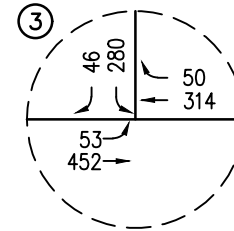
Figures 6-10 and *6-11* illustrate the Year 2040 With Project traffic conditions during the AM peak hour and PM peak hour, respectively.



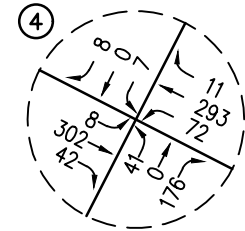
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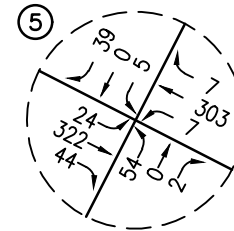
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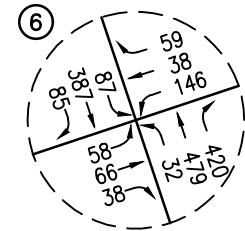
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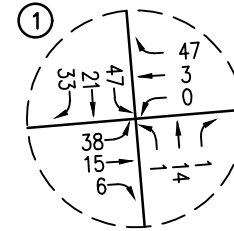
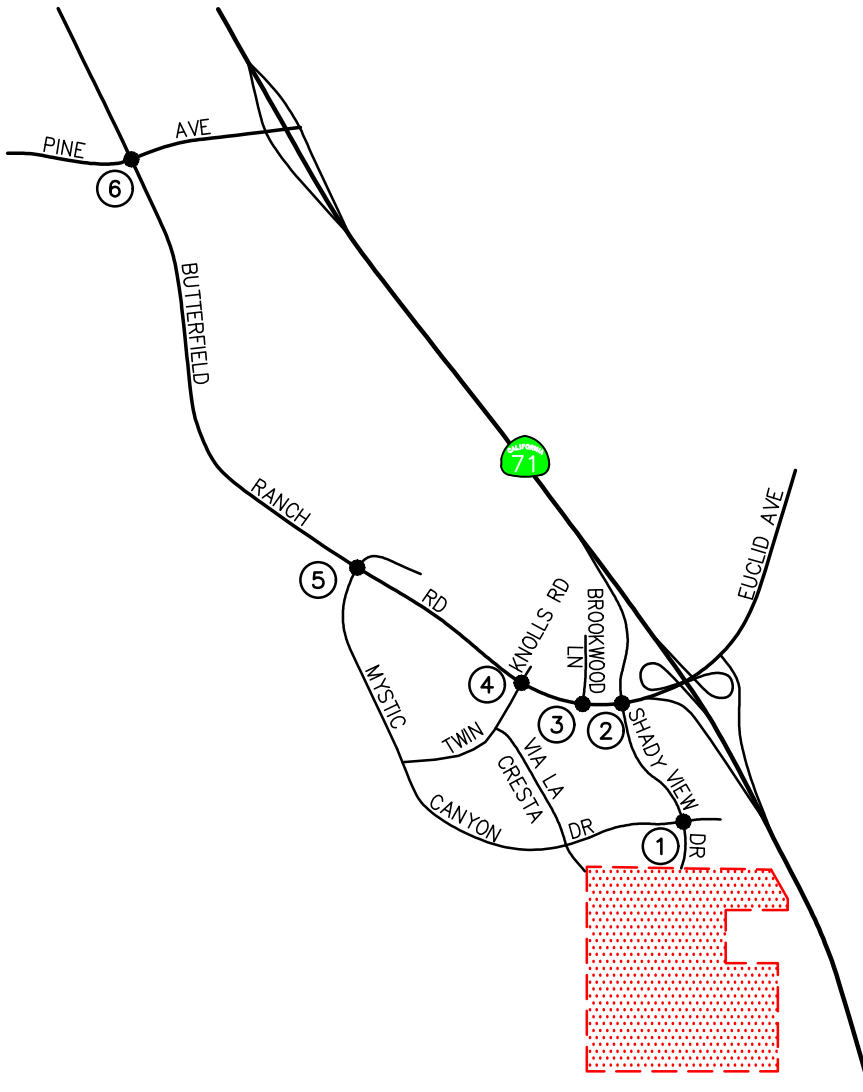
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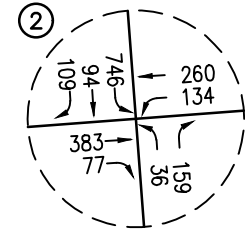
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FIGURE 6-4

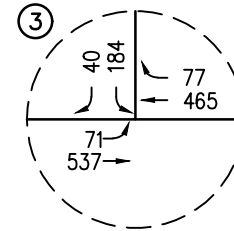
YEAR 2024 WITHOUT PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



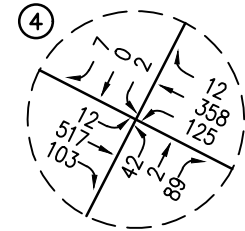
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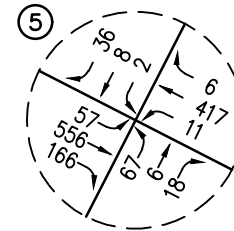
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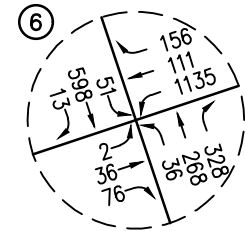
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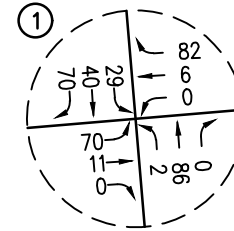
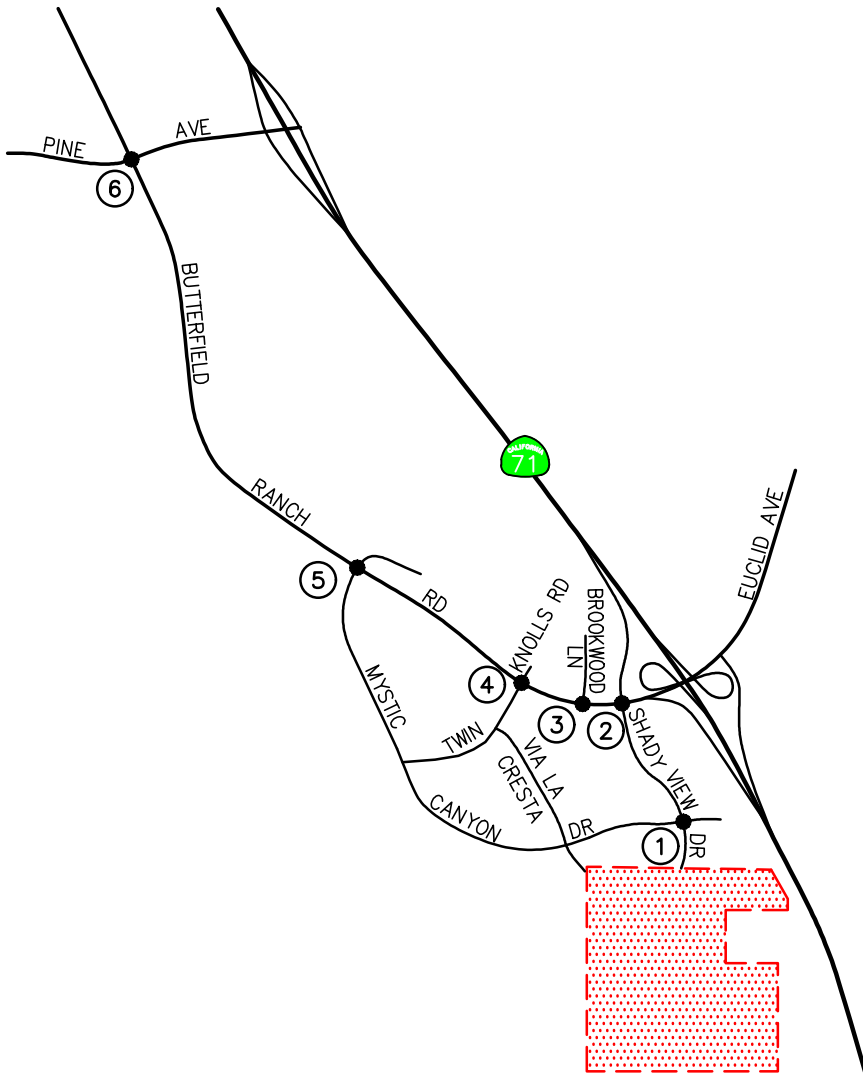
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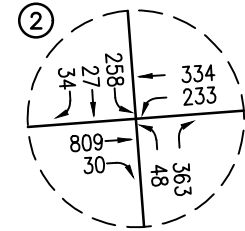
- ① = STUDY INTERSECTION
- ▨ = PROJECT SITE

FIGURE 6-5

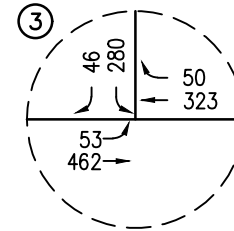
YEAR 2024 WITHOUT PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



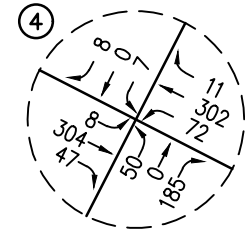
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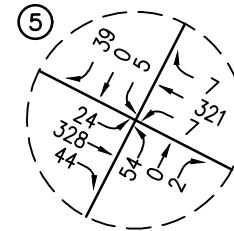
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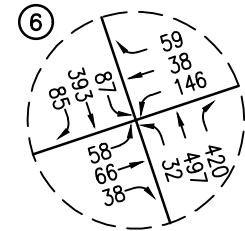
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TWIN KNOLLS DR @ BUTTERFIELD RANCH RD



MYSTIC CANYON DR @ BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @ PINE AVE

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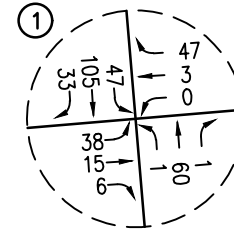
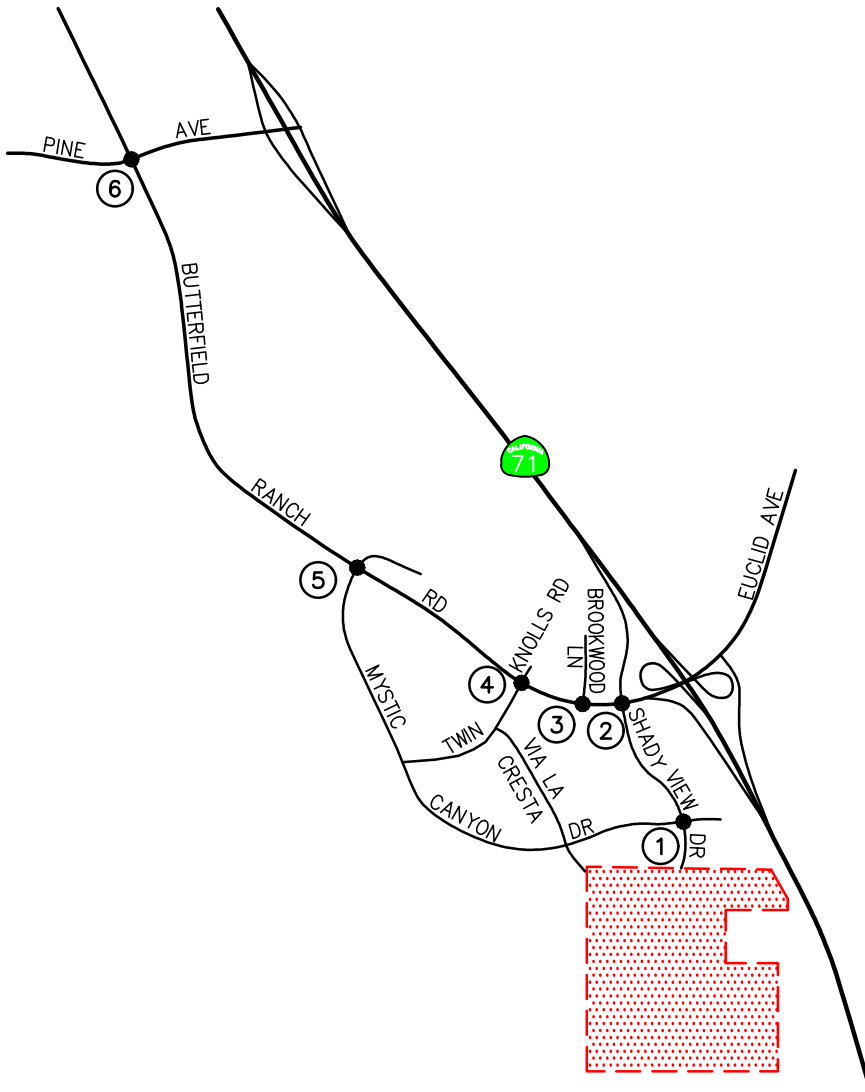
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engineers



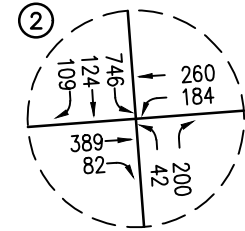
KEY
= STUDY INTERSECTION
[Red Hatched Box] = PROJECT SITE

FIGURE 6-6

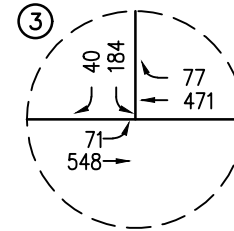
YEAR 2024 WITH PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



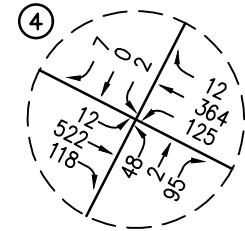
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MYSTIC CANYON DR



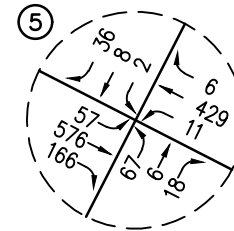
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BUTTERFIELD RANCH RD



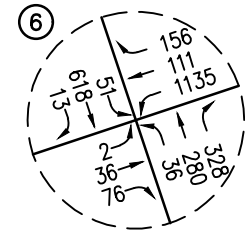
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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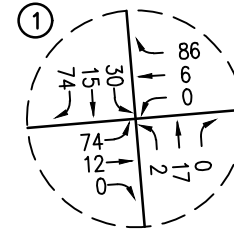
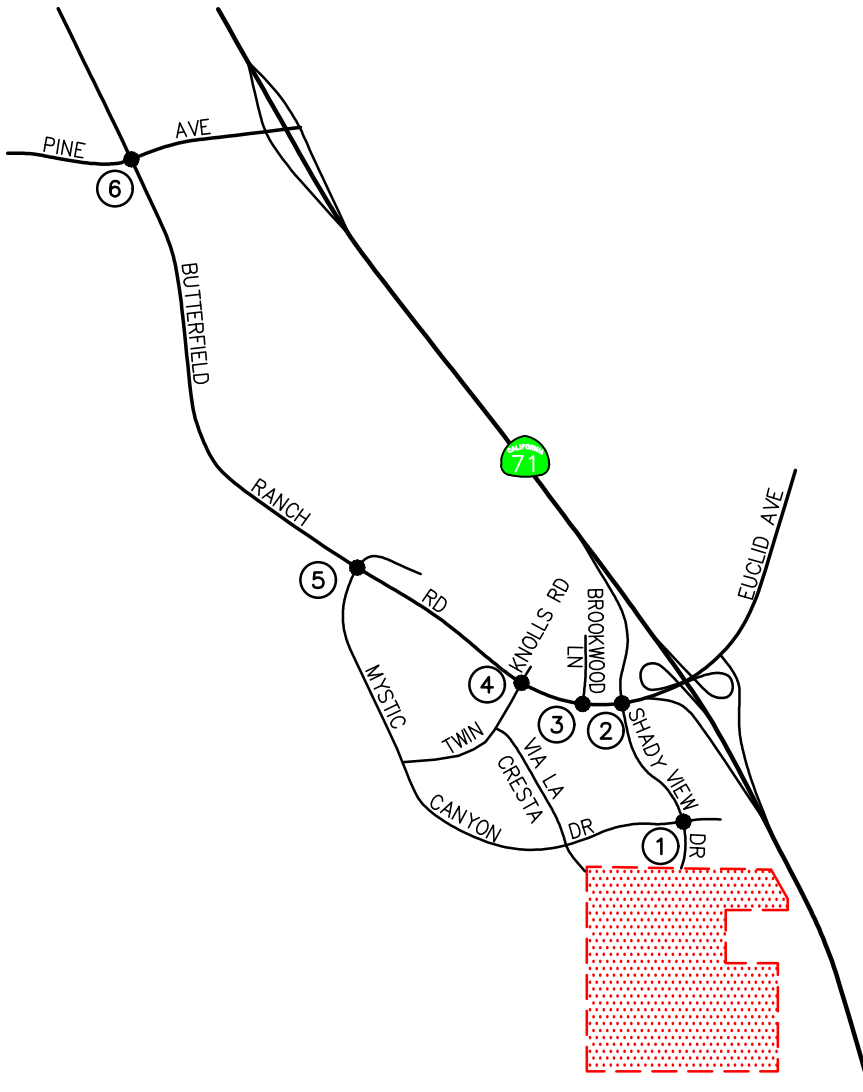
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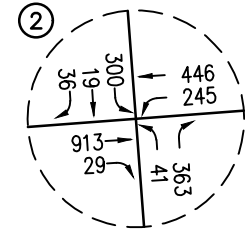
- ① = STUDY INTERSECTION
- ▨ = PROJECT SITE

FIGURE 6-7

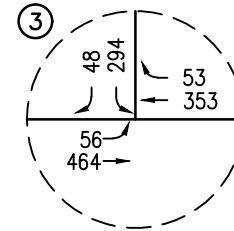
YEAR 2024 WITH PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



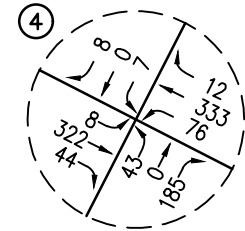
SHADY VIEW DR @
MYSTIC CANYON DR



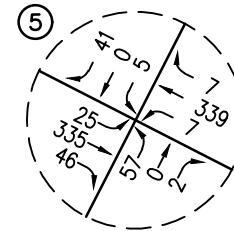
SHADY VIEW DR @
BUTTERFIELD RANCH RD



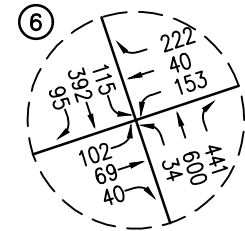
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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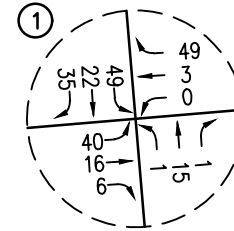
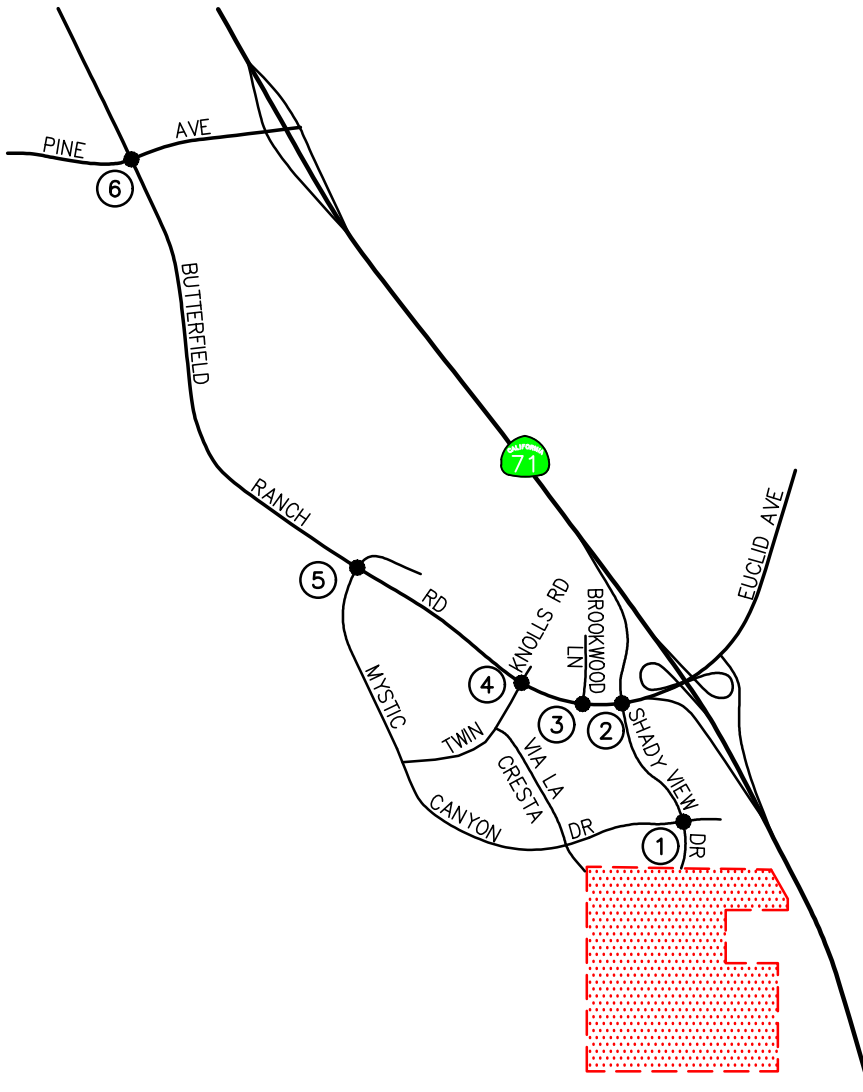
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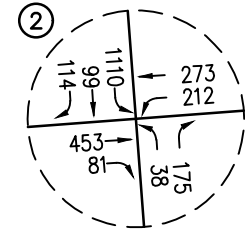
- = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 6-8

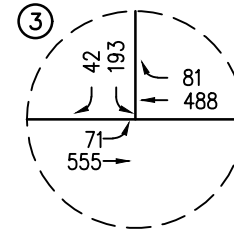
YEAR 2040 WITHOUT PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



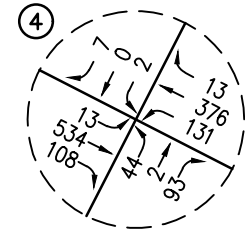
SHADY VIEW DR @
MYSTIC CANYON DR



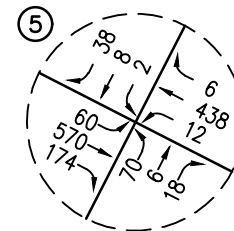
SHADY VIEW DR @
BUTTERFIELD RANCH RD



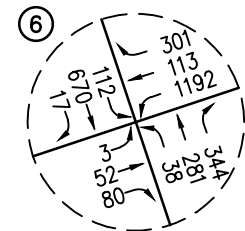
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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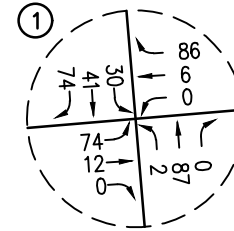
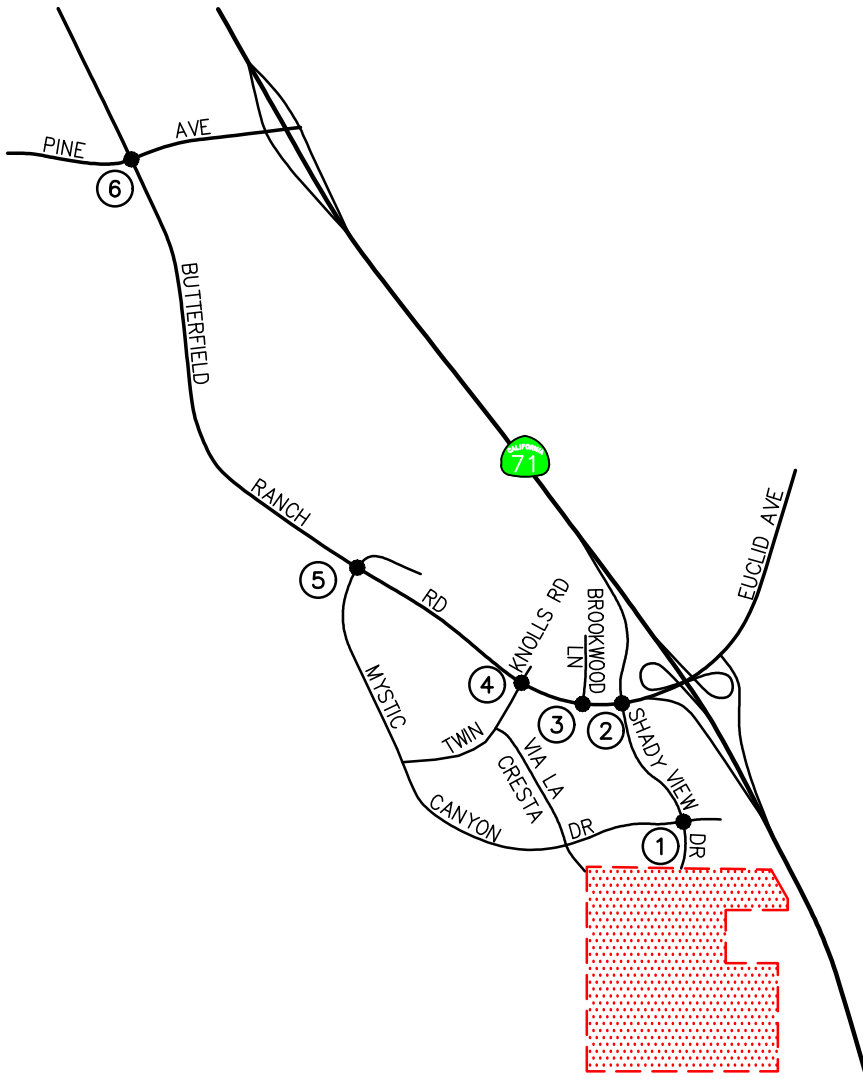
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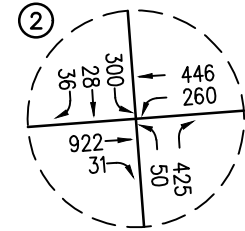
- ① = STUDY INTERSECTION
- ▨ = PROJECT SITE

FIGURE 6-9

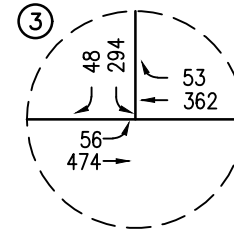
YEAR 2040 WITHOUT PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



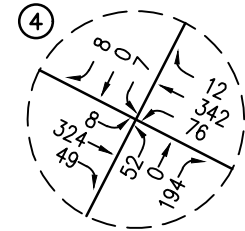
SHADY VIEW DR @
MYSTIC CANYON DR



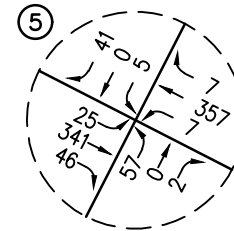
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BUTTERFIELD RANCH RD



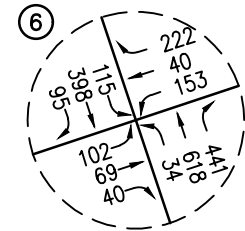
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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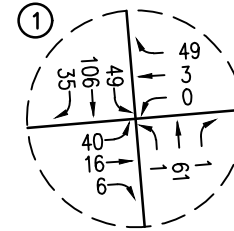
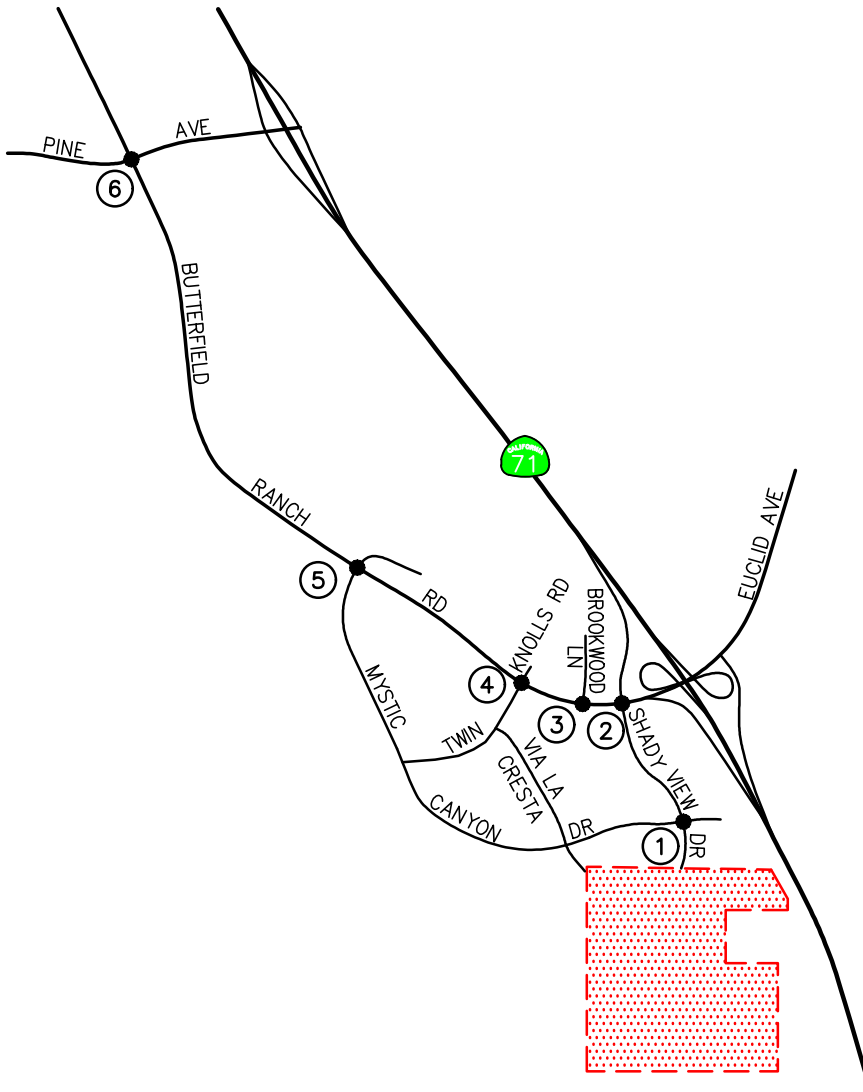
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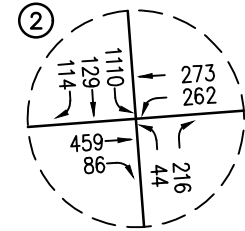
- ① = STUDY INTERSECTION
- ▨ = PROJECT SITE

FIGURE 6-10

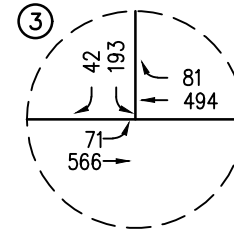
YEAR 2040 WITH PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



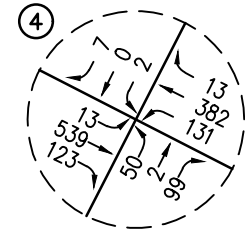
SHADY VIEW DR @
MYSTIC CANYON DR



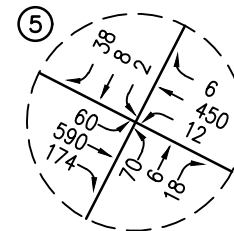
SHADY VIEW DR @
BUTTERFIELD RANCH RD



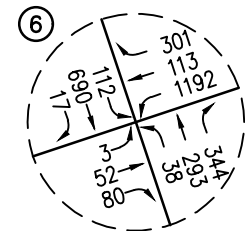
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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NO SCALE

KEY

- # = STUDY INTERSECTION
- [Red Dotted Box] = PROJECT SITE

FIGURE 6-11

YEAR 2040 WITH PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS

7.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The relative impact of the added peak hour Project traffic volumes generated by the Project have been evaluated based on the analysis of future operating conditions at six (6) key study intersections. Operating conditions at the key study intersections were evaluated during the AM and PM peak hours for existing traffic conditions and future near-term (2024) and long-term (2040) traffic conditions without, then with the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future volume-to-capacity relationships and service level characteristics at each study intersection. The significance of the potential impacts of the Project at each key intersection was then evaluated using traffic impact criteria identified earlier and again summarized below.

7.1 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity calculations have been performed at the six (6) key intersections for near-term (Year 2024) and long-term (2040) conditions:

- (a) Existing traffic;
- (b) Existing plus Project conditions;
- (c) Traffic in (b) plus mitigation (as required);
- (d) Existing traffic plus ambient growth to the Year 2024 plus cumulative Project traffic;
- (e) Traffic in (d) plus Project conditions;
- (f) Traffic in (e) plus mitigation (as required);
- (g) Long-term (Year 2040) Buildout traffic;
- (h) Traffic in (g) plus Project conditions; and
- (i) Traffic in (h) plus mitigation (as required).

7.2 Definition of Deficiency and Significance Criteria

City of Chino Hills

According to the City of Chino Hills guidelines, a significant traffic impacts occurs when the intersections or roadway projected to operate at LOS D or better without the Project would exceed LOS D with the Project. A significant traffic impact is also considered to occur if the Project results in an increase of 0.01 or more in the volume-to-capacity (V/C) ratio at a location that is projected to operate at LOS E or F without the Project.

8.0 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

8.1 Existing With Project Traffic Analysis

Table 8-1 summarizes the peak hour level of service results at the six (6) key study intersections for Existing traffic conditions. The first column (1) of HCM//LOS values in *Table 8-1* presents a summary of existing AM and PM peak hour traffic conditions (which were also presented in *Table 3-3*). The second column (2) lists Existing With Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fourth column (4) indicates the anticipated LOS with planned and/or recommended improvements, if any.

8.1.1 Existing With Project Traffic Conditions

Review of columns (2) and (3) of *Table 8-1* indicates that the traffic associated with the proposed Project will not have a significant impact at any of the six (6) key study intersections. All of the key study intersections are forecast to operate at an acceptable LOS with the addition of Project generated traffic.

Although the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4) is forecast to operate at an acceptable LOS, the study intersection satisfies the criteria for a traffic signal. Section 9.0 of this report discusses the traffic signal warrant analysis at the study intersection. As such, a traffic signal is included as a recommended improvement to facilitate vehicular access at this intersection and provide another means for pedestrians to cross Butterfield Ranch and improve pedestrian connectivity with the marked crosswalks. As shown in column (4) of *Table 8-1*, the installation of a traffic signal at the intersection will help improve the level of service during both the AM and PM peak hours.

Additionally, queues for the SR-71 SB Off-Ramp were reviewed and the existing vehicular storage capacity is considered adequate under Existing With Project traffic conditions.

Appendix C presents the Existing With Project Delay/LOS/Queuing calculations for the key study intersections for the AM peak hour and PM peak hour.

**TABLE 8-1
EXISTING WITH PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Existing With Project Traffic Conditions			(3) Significant Impact			(4) Existing With Project With Mitigation		
		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	8.3	0.197	A	0.5	0.046	No	--	--	--
	PM	7.6	0.142	A	8.5	0.279	A	0.9	0.137	No	--	--	--
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	54.8	0.752	D	15.9	0.037	No	--	--	--
	PM	46.1	0.619	D	53.1	0.690	D	7.0	0.071	No	--	--	--
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.3	0.347	B	0.0 ¹⁶	0.003	No	--	--	--
	PM	11.0	0.326	B	10.9	0.328	B	0.0 ¹⁶	0.002	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	14.6	0.157	B	0.3	0.127	No	13.1	0.286	B ¹⁷
	PM	23.0	0.013	C	26.3	0.014	D	3.3	0.001	No	7.6	0.306	A ¹⁷
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.8	0.155	D	0.3	0.002	No	--	--	--
	PM	30.4	0.303	C	30.1	0.311	C	0.0 ¹⁶	0.008	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	17.7	0.360	B	0.0 ¹⁶	0.000	No	--	--	--
	PM	33.6	0.600	C	33.4	0.607	C	0.0 ¹⁶	0.007	No	--	--	--

Note:

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

¹⁶ Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.0 s/v.

¹⁷ Although the intersection is not considered a significant impact, review of Section 9.0 of this report indicates the intersection satisfies the criteria for the installation of a traffic signal. Therefore, the installation of a traffic signal at this location is recommended as an improvement.

8.2 Year 2024 Traffic Analysis

Table 8-2 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 structure of this table is similar to that of *Table 8-1*, however, 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 Project traffic. The fourth column (4) of *Table 8-2* indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and impact criteria identified earlier. The fifth column (5) indicates the anticipated LOS with planned and/or recommended improvements, if any.

8.2.1 Year 2024 Without Project Traffic Conditions

Review of column (2) of *Table 8-2* indicates that one (1) of the six (6) key study intersections are forecast to operate adversely when compared to the LOS standards and are projected to be cumulatively impacted by ambient traffic growth and related projects traffic based on significant impact criteria specified in this report. The remaining key study intersections are forecast to continue to operate at LOS D or better during the weekday AM and PM peak hours with the addition of ambient traffic growth and cumulative project traffic.

8.2.2 Year 2024 With Project Traffic Conditions

Review of columns (3) and (4) of *Table 8-2* indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City's LOS standards and impact criteria.

However, further review of columns (3) and (4) of *Table 8-2* indicates that traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City's LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic.

As shown in column (5) of *Table 8-2*, the implementation of recommended improvements at the intersection significantly impacted by the Project completely off-sets the impacts of the proposed Project and future background traffic as the improvements will offset the Project's impacts based on the appropriate City's impact criteria. As a result, the Project's significant cumulative impacts under Year 2024 With Project traffic conditions are reduced to a level of insignificance.

Although the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4) is forecast to operate at an acceptable LOS, the study intersection satisfies the criteria for a traffic signal. Section 9.0 of this report discusses the traffic signal warrant analysis at the study intersection. As such, a traffic signal is included as a recommended improvement to facilitate vehicular access at this intersection and provide another means for pedestrians to cross Butterfield Ranch and improve pedestrian connectivity with the marked crosswalks. As shown in column (5) of *Table 8-2*, the installation of a traffic signal at the intersection will help improve the level of service during both the AM and PM peak hours.

Additionally, queues for the SR-71 SB Off-Ramp were reviewed and the existing vehicular storage capacity is considered adequate under Year 2024 With Project traffic conditions with the implementation of recommended mitigation measures.

Appendix E presents the Year 2024 Delay/LOS/Queuing calculations for the key study intersections for the AM peak hour and PM peak hour.

TABLE 8-2
YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Year 2024 Without Project Traffic Conditions			(3) Year 2024 With Project Traffic Conditions			(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	8.0	0.171	A	0.4	0.037	No	--	--	--
	PM	7.6	0.142	A	7.5	0.120	A	8.1	0.228	A	0.6	0.108	No	--	--	--
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	42.0	0.731	D	57.0	0.771	E	15.0	0.040	Yes	24.6	0.710	C
	PM	46.1	0.619	D	49.8	0.633	D	55.6	0.709	E	5.8	0.076	Yes	45.6	0.575	D
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.1	0.353	B	15.0	0.356	B	0.0 ¹⁹	0.003	No	--	--	--
	PM	11.0	0.326	B	10.7	0.330	B	10.7	0.332	B	0.0	0.002	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	13.9	0.132	B	14.7	0.165	B	0.8	0.033	No	12.7	0.285	B ¹⁸
	PM	23.0	0.013	C	25.2	0.014	D	29.0	0.015	D	3.8	0.001	No	7.4	0.312	A ¹⁸
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.4	0.157	D	36.7	0.159	D	0.3	0.002	No	--	--	--
	PM	30.4	0.303	C	30.5	0.303	C	30.3	0.309	C	0.0 ¹⁹	0.006	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	18.1	0.435	B	18.0	0.435	B	0.0 ¹⁹	0.000	No	--	--	--
	PM	33.6	0.600	C	60.1	0.734	E	59.7	0.741	E	0.0 ¹⁹	0.007	No	--	--	--

Note:

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

¹⁸ Although the intersection is not considered a significant impact, review of Section 9.0 of this report indicates the intersection satisfies the criteria for the installation of a traffic signal. Therefore, the installation of a traffic signal at this location is recommended as an improvement.

¹⁹ Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.0 s/v.

8.3 Year 2040 Traffic Analysis

Table 8-3 summarizes the weekday AM peak hour and PM peak Level of Service results at the six (6) key study intersections for the Year 2040 scenario. The structure of this table is similar to that of *Table 8-2*. The second column (2) lists forecast Year 2040 traffic conditions based on existing intersection geometry and/or planned improvements/traffic control, but without any traffic generated from the proposed Project. The third column (3) presents forecast Year 2040 traffic conditions with the addition of traffic generated by the Project. The fourth column (4) indicates whether the traffic associated with the Project will have a significant impact based on the LOS standards and impact criteria previously mentioned. The fifth column (5) indicates the anticipated level of service with recommended improvements to off-set the cumulative traffic impact of long-term (Year 2040) traffic volumes.

8.3.1 Year 2040 Without Project Traffic Conditions

Review of column (2) of *Table 8-3* shows that under Year 2040 Without Project traffic conditions, two (2) of the six (6) key study intersections are forecast to operate adversely when compared to the LOS standards and are projected to be cumulatively impacted by future buildout traffic based on significant impact criteria specified in this report. The remaining key study intersections are forecast to operate at an acceptable LOS during the weekday AM peak hour and PM peak hour under Year 2040 Without Project traffic conditions.

8.3.2 Year 2040 With Project Traffic Conditions

Review of columns (3) and (4) of *Table 8-3* indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City's LOS standards and impact criteria.

Review of columns (3) and (4) of *Table 8-3* indicates that traffic associated with the proposed Project will have a cumulative impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection under a long-term cumulative traffic setting based on the City's LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic.

As shown in column (5) of *Table 8-3*, the implementation of the recommended mitigation measures, the Project's cumulative impacts under long-term (Year 2040) traffic conditions are reduced to a level of insignificance as the improvements will offset the Project's impacts based on the City's impact criteria. As a result, the Project's cumulative impacts under Year 2040 With Project traffic conditions are reduced to a level of insignificance.

Although the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4) is forecast to operate at an acceptable LOS, the study intersection satisfies the criteria for a traffic signal. Section 9.0 of this report discusses the traffic signal warrant analysis at the study intersection. As such, a traffic signal is included as a recommended improvement to facilitate vehicular access at this intersection and provide another means for pedestrians to cross Butterfield Ranch and improve pedestrian connectivity with the marked crosswalks. As shown in column (5) of *Table 8-3*, the installation of a traffic signal at the intersection will help improve the level of service during both the AM and PM peak hours.

Additionally, queues for the SR-71 SB Off-Ramp were reviewed and the existing vehicular storage capacity is considered adequate under Year 2040 With Project traffic conditions with the implementation of recommended mitigation measures.

Appendix F presents the Year 2040 Delay/LOS/Queuing calculations for the key study intersections for the AM peak hour and PM peak hour.

**TABLE 8-3
YEAR 2040 PEAK HOUR INTERSECTION CAPACITY ANALYSIS**

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Year 2040 Without Project Traffic Conditions			(3) Year 2040 With Project Traffic Conditions			(4) Significant Impact			(5) Year 2040 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	7.7	0.142	A	8.1	0.179	A	0.4	0.037	No	--	--	--
	PM	7.6	0.142	A	7.5	0.128	A	8.2	0.236	A	0.7	0.108	No	--	--	--
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	53.9	0.785	D	74.0	0.831	E	20.1	0.046	Yes	24.0	0.762	C
	PM	46.1	0.619	D	110.6	0.802	F	132.2	0.873	F	21.6	0.071	Yes	102.5	0.726	F
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.0	0.346	B	14.9	0.350	B	0.0 ²⁰	0.004	No	--	--	--
	PM	11.0	0.326	B	10.7	0.327	B	10.6	0.329	B	0.0 ²⁰	0.002	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	14.9	0.030	B	15.8	0.188	C	0.9	0.158	No	12.5	0.300	B ²¹
	PM	23.0	0.013	C	28.5	0.016	D	33.4	0.016	D	4.9	0.000	No	7.5	0.323	A ²¹
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.6	0.155	D	36.9	0.157	D	0.3	0.002	No	--	--	--
	PM	30.4	0.303	C	30.5	0.296	C	30.3	0.302	C	0.0 ²⁰	0.006	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	22.4	0.450	C	22.3	0.450	C	0.0 ²⁰	0.000	No	--	--	--
	PM	33.6	0.600	C	56.3	0.750	E	56.0	0.756	E	0.0 ²⁰	0.006	No	--	--	--

Note:

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

²⁰ Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.0 s/v.

²¹ Although the intersection is not considered a significant impact, review of Section 9.0 of this report indicates the intersection satisfies the criteria for the installation of a traffic signal. Therefore, the installation of a traffic signal at this location is recommended as an improvement.

9.0 TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis has been prepared for the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4). The traffic signal warrant analysis for this key intersection is based on the applicable signal warrant criteria/guidelines contained in the 2014 Edition of the California *Manual on Uniform Traffic Control Devices (CA MUTCD)*.

The traffic signal warrant analysis uses daily approach traffic volumes and pedestrian volumes collected at Twin Knolls Drive and Butterfield Ranch Road in November 2020. Year 2021 Pre-COVID-19 daily traffic volumes were established based on the same methodology discussed in Section 3.2. In addition, accident data was researched at the intersection via SWITRS, which is a state-wide traffic data system used for collecting traffic collisions.

This assessment is made based on the warrants set forth in Part 4 (Highway Traffic Signals) of the *CA MUTCD*. The above-referenced manual lists nine parameters which help to determine the necessity of a traffic signal at an intersection. Provided below are the traffic signal warrants that were applied to the intersection of Twin Knolls Drive at Butterfield Ranch Road; Warrants No. 5 and 9 were not applicable.

- Warrant No. 1: Eight Hour Volume Warrant
- Warrant No. 2: Four Hour Volume Warrant
- Warrant No. 3: Peak Hour Traffic Volumes Warrant
- Warrant No. 4: Pedestrian Volume Warrant
- Warrant No. 6: Coordinated Signal System Warrant
- Warrant No. 7: Crash Experience Warrant
- Warrant No. 8: Roadway Network

Table 9-1 provides a summary of the results for each of the applicable traffic signal warrants. As indicated above, each warrant analyzes a different traffic condition and any one satisfied warrant may be used as a basis for installing a traffic signal. Review of *Table 9-1* indicates that based on the existing traffic and pedestrian volumes, current intersection geometrics, and review of the accident data, the study intersection satisfies the criteria for a traffic signal based on Warrants No. 1, 2 and 3. As such, it is recommended to install a traffic signal at Twin Knolls Drive and Butterfield Ranch Road. Signalizing the intersection will help improve traffic flow and pedestrian connectivity within the adjacent Butterfield Ranch neighborhoods. Given that future operating conditions at the intersection of Shady View Drive/SR-71 SB Off-Ramp and Butterfield Ranch Road are forecast to deteriorate to LOS F conditions, it is likely that Twin Knolls Drive would be more attractive to motorists who wish to bypass congestion and traffic delays at this location. Furthermore, taking into consideration the proximity to adjacent traffic signals, the proposed traffic signal could be easily integrated into the existing traffic signal network and thus would not result in undue congestion.

Appendix G contains the signal warrant worksheets for existing traffic conditions. **Appendix B** presents the existing daily traffic count and pedestrian data.

TABLE 9-1
TWIN KNOLLS DRIVE AT BUTTERFIELD RANCH ROAD
TRAFFIC SIGNAL WARRANT ANALYSIS SUMMARY²²

Traffic Signal Warrant	(1) Existing Traffic Conditions	
	Warrant Satisfied?	
	Yes	No
Warrant 1 - Eight Hour Volume Warrant <ul style="list-style-type: none"> ➤ <i>Minimum Vehicular Volume</i> <ul style="list-style-type: none"> ▪ <i>100% Satisfied</i> ▪ <i>80% Satisfied</i> ➤ <i>Interruption of Continuous Traffic</i> <ul style="list-style-type: none"> ▪ <i>100% Satisfied</i> ▪ <i>80% Satisfied</i> 		X X
Warrant 2 - Four Hour Volume	X	
Warrant 3 - Peak Hour Volume Warrant	X	
Warrant 4 - Pedestrian Volume Warrant		X
Warrant 5 - School Crossing Warrant	Not Applicable	
Warrant 6 - Coordinated Signal System Warrant		X
Warrant 7 - Crash Experience Warrant		X
Warrant 8 - Roadway Network		X
Warrant 9 - Intersection Near at Grade Crossing	Not Applicable	
TRAFFIC SIGNAL WARRANT MET?	YES	

²² Source: California *Manual on Uniform Traffic Control Devices* (MUTCD).

10.0 AREA-WIDE TRAFFIC IMPROVEMENTS

For the intersections where projected traffic volumes are expected to result in poor operating conditions, this report recommends (identifies) improvements, which change the intersection geometry to increase capacity. These capacity improvements usually involve roadway widening and/or restriping to reconfigure or add lanes to various approaches of a key intersection. The proposed improvements are expected to offset the impact of future traffic and improve Levels of Service to an acceptable range and/or to pre-Project conditions.

Transportation improvements throughout San Bernardino County are funded through a combination of direct Project mitigation, fair share contributions or development impact fee programs. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

10.1 Recommended Improvements

10.1.1 Existing With Project Recommended Circulation Enhancements

The following improvements listed below have been identified as a circulation enhancement to facilitate access at the subject intersection for both existing traffic and project-related traffic volumes, and improve traffic flow and pedestrian connectivity within the adjacent Butterfield Ranch neighborhoods. Further, given future operating conditions at the intersection of Shady View Drive/SR-71 SB Off-Ramp and Butterfield Ranch Road are forecast to deteriorate to LOS F conditions, it is likely that motorists would divert to Twin Knolls Drive to avoid congestion and traffic delays at this location. The Project can be expected to construct the recommended circulation enhancements:

- **No. 4 – Twin Knolls Drive at Butterfield Ranch Road:** Install a two-phase traffic signal. Additional improvements beyond those required for construction/installation of a 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 need to conform to the City of Chino Hills Standard Design Guidelines and/or *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The City will require the recommended installation of a traffic signal at this location as a condition of Project approval.

10.1.2 Year 2024 With Project Recommended Improvements and/or Circulation Enhancements

The following improvements listed below have been identified to off-set the Project's significant traffic impacts for Year 2024 With Project traffic conditions and/or as a circulation enhancement. The Project can be expected to construct the recommended improvements and circulation enhancements:

- **No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road:** Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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).

- **No. 4 – Twin Knolls Drive at Butterfield Ranch Road:** (*Circulation Improvements identical to those identified in Section 10.1.1*) Install a two-phase traffic signal. Additional improvements beyond those required for construction/installation of a 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 need to conform to the City of Chino Hills Standard Design Guidelines and/or *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The City will require the recommended installation of a traffic signal at this location as a condition of Project approval.

10.1.3 Year 2040 With Project Recommended Improvements and/or Circulation Enhancements

The following improvements listed below have been identified to off-set projected long-term significant traffic impacts of the Project for Year 2040 With Project traffic conditions and/or as a circulation enhancement. The Project can be expected to construct the recommended improvements and circulation enhancements:

- **No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road:** (*Improvements identical to those identified in Section 10.1.2*) Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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).
- **No. 4 – Twin Knolls Drive at Butterfield Ranch Road:** (*Circulation Improvements identical to those identified in Sections 10.1.1 and 10.1.2*) Install a two-phase traffic signal. Additional improvements beyond those required for construction/installation of a 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 need to conform to the City of Chino Hills Standard Design Guidelines and/or *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The City will require the recommended installation of a traffic signal at this location as a condition of Project approval.

Figure 10-1 graphically illustrates the recommended improvements for Existing With Project, Year 2024 With Project, and Year 2040 With Project traffic conditions.

10.2 Improvement Costs

This section of the report summarizes the improvements and associated costs required to meet level of service requirements for Year 2024 With Project and Year 2040 With Project traffic conditions. The improvement costs have been estimated using cost guidelines contained in *Appendix G of the*

San Bernardino County CMP, 2009 Update as well as our general knowledge based on extensive working with contractors and vendor on outside projects. Unit costs for improvement measure identified in this report are presented below:

<u>Intersection Improvement</u>	<u>Unit Cost</u>
☐ Restripe	\$25,000.00
☐ Traffic Signal Modification	\$75,000.00
☐ Traffic Signal Installation	\$350,000.00

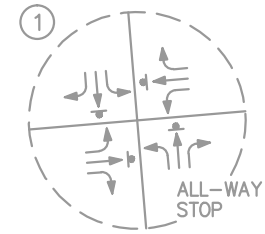
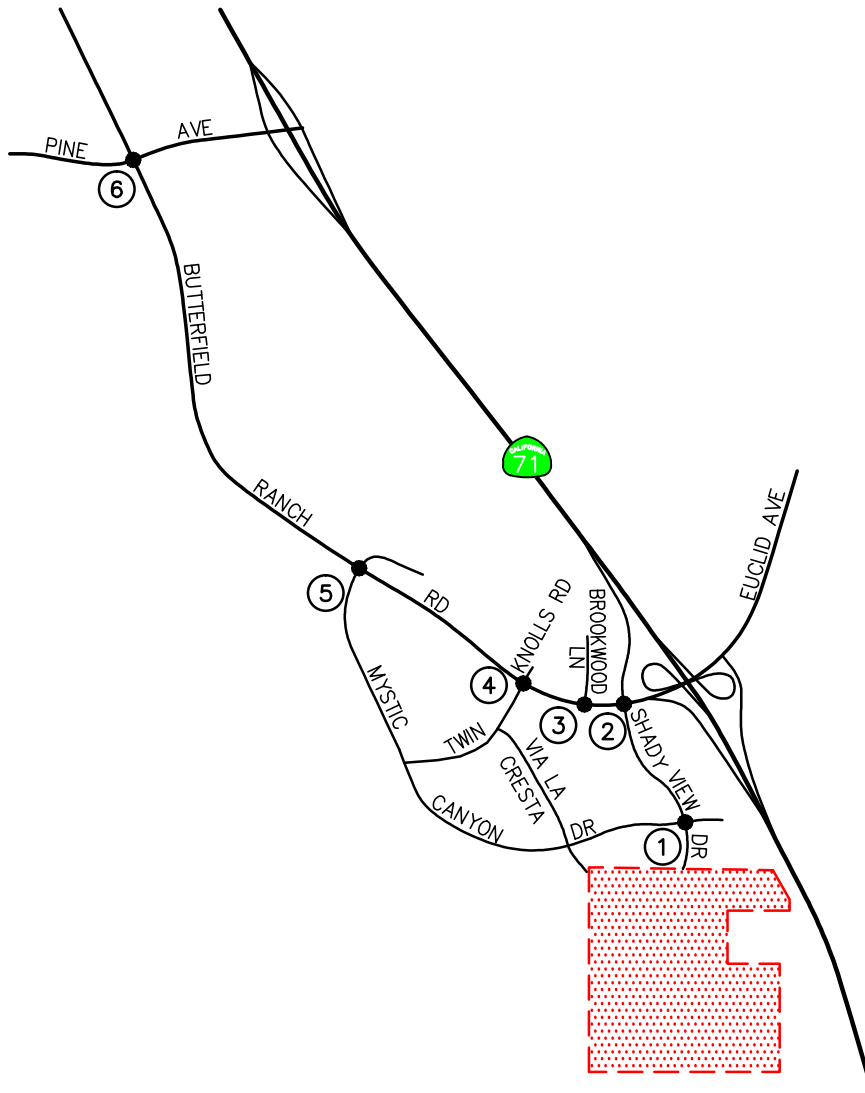
Table 10-1 presents the recommended improvements and their respective costs needed by relevant study years to maintain acceptable service levels based on the LOS standards defined in this report. **Table 10-1** provides order of magnitude cost estimates for these improvements and are subject to change based on future detailed engineering estimates.

10.2.1 Year 2024 With Project Improvement Costs

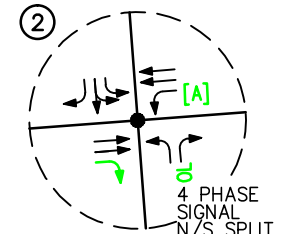
As presented in column (1) of **Table 10-1**, the cost to implement recommended intersection improvements identified in this report to off-set the Year 2024 With Project traffic impacts is estimated to total **\$450,000.00**.

10.2.2 Year 2040 With Project Improvement Costs

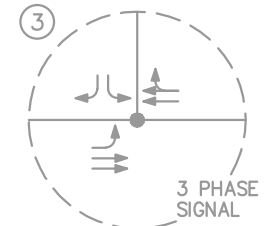
As presented in column (2) of **Table 10-1**, the cost to implement recommended intersection improvements identified in this report to off-set the Year 2040 With Project traffic impacts amounts to **\$0.00** since the mitigation measures are identical to that recommended for Year 2024 With Project conditions.



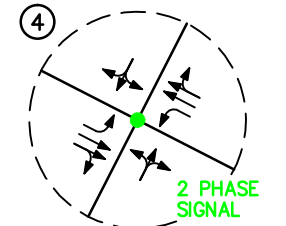
SHADY VIEW DR @
MYSTIC CANYON DR



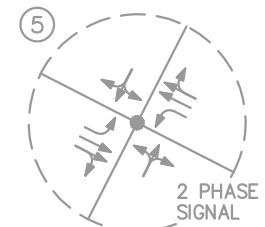
SHADY VIEW DR @
BUTTERFIELD RANCH RD



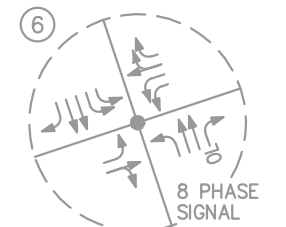
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

NOTES

[A] = MODIFY SIGNAL TO INCLUDE PROTECTED/PERMISSIVE PHASING FOR THE WBL MOVEMENT

n:\4300\2204\345 - shady view tia & vmt analysis, chino hills.dwg\4345 f10-1.dwg LDP 16:26:32 10-20-2021 aguilera

LINSCOTT
LAW &
GREENSPAN
engineers



- KEY**
- ← = APPROACH LANE ASSIGNMENT
 - = RECOMMENDED IMPROVEMENTS
 - = TRAFFIC SIGNAL, ▼ = STOP SIGN
 - ▨ = PROJECT SITE

FIGURE 10-1

RECOMMENDED IMPROVEMENTS
SHADY VIEW PROJECT, CHINO HILLS

**TABLE 10-1
RECOMMENDED IMPROVEMENTS AND COSTS²³**

Key Intersections (Jurisdiction)	Improvement Description	Improvement Cost	Improvements by Scenario	
			(1) Year 2024 With Project	(2) Year 2040 With Project
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Chino Hills/Caltrans)	<ul style="list-style-type: none"> ▪ Restripe the eastbound approach to include an exclusive right-turn pocket 	\$25,000.00	✓	X
	<ul style="list-style-type: none"> ▪ Modify existing traffic signal to include a northbound right-turn overlap and protected/permissive phasing for the westbound left-turn 	\$75,000.00	✓	X
	Total:			\$100,000.00
4. Twin Knolls Drive at Butterfield Ranch Road (Chino Hills)	<ul style="list-style-type: none"> ▪ Install a two-phase traffic signal and associated signing and striping improvements. 	\$350,000.00	✓	X
	Total:			\$350,000.00
TOTAL ESTIMATED COST OF RECOMMENDED IMPROVEMENTS			\$450,000.00	\$0.00

Notes:

✓ = Denotes that the improvement is implemented in the scenario.

X = Denotes that the improvement carries over from the previous scenario and is assumed to be already implemented and therefore is not considered in the cost.

²³ The improvement costs have been estimated using cost guidelines contained in *Appendix G of the San Bernardino County CMP, 2009 Update* as well as our general knowledge based on extensive working with contractors and vendor on outside projects.

11.0 DEVELOPMENT IMPACT FEES

11.1 City of Chino Hills Traffic-Related Development Impact Fees

Pursuant to the requirements of the City of Chino Hills, a Traffic Facilities fee and a Traffic Impact Fee will be required of the Project per the current City's Development Impact Fee (DIF) schedule. The traffic-related DIF is applied to pay a portion of the costs identified for public facilities, including transportation-related improvements. According to information provided by the City and review of the *City of Chino Hills Annual Development Impact Fee Financial Report Fiscal Year 2019-2020*, the current fee schedule is summarized in **Table 11-1**. The DIF is based on the size of all new developments, with the cost per unit or cost per square-foot of development determined based on the type of development (i.e. single-family, multi-family, retail, office/commercial, industrial, etc.).

Per the *City of Chino Hills Annual Development Impact Fee Financial Report Fiscal Year 2019-2020*, the Traffic Facilities Fee is used toward the funding of the Pine Avenue Extension and Soquel Canyon Extension, whereas the Traffic Impact Fee would be used to fund intersection and roadway improvements that were identified to off-set the traffic impact of future development within the City.

Application to the appropriate DIF rates summarized in *Table 11-1* to the proposed Project results in a preliminary estimate of **\$40,068.00** attributable to the Traffic Facilities Fee and **\$88,181.40** attributable to the Traffic Impact Fee, as detailed below:

- Traffic Facilities Fee: 159 DU single-family × \$252.00 per unit = \$40,068.00
- Traffic Impact Fee: 159 DU single-family × \$554.60 per unit = \$88,181.40

It is noted that Project's payment of the Traffic Impact-related DIF fee will off-set its contributory impacts to those facilities included in the City's DIF program. The precise fee will be collected prior to the issuance of building permits by the City of Chino Hills.

**TABLE 11-1
CITY OF CHINO HILLS TRAFFIC-RELATED DEVELOPMENT IMPACT FEE RATES²⁴**

Type of Development	Traffic Facilities Rate (\$ per unit)	Traffic Impact Rate (\$ per unit or SF)
<u>Residential</u>		
▪ Single-Family	\$252 per unit	\$554.60 per unit
▪ Multi-Family	\$252 per unit	\$385.38 per unit
<u>Retail/Commercial/Industrial</u>		
▪ Retail	--	\$1.70 per SF
▪ Office	--	\$0.64 per SF
▪ Industrial	--	\$0.40 per SF

²⁴ Source: City of Chino Hills *Annual Development Impact Fee Financial Report Fiscal Year 2019-2020*.

12.0 SITE ACCESS EVALUATION

12.1 Project Site Access and Internal Circulation

Vehicular access to the proposed Project will be provided via the proposed extension of Shady View Drive and Via La Cresta from its current southerly terminus into the Project site to connect to a proposed local residential network of streets.

The on-site circulation layout of the proposed Project as illustrated in *Figure 2-2* in an overall basis is generally adequate. Curb return radii have been confirmed and are generally adequate for small service/delivery (FedEx, UPS) trucks and trash trucks, as well as fire trucks. The on-site circulation was evaluated in terms of vehicle-pedestrian conflicts. Based on our review of the preliminary site plan, the overall layout does not create significant vehicle-pedestrian conflict points. As such, motorists entering and exiting the Project site from this driveway will be able to do so comfortably, safely and without undue congestion.

12.2 Via La Cresta Circulation

There are concerns regarding how the proposed Project will affect traffic flow within the adjacent neighborhood located along Via La Cresta due to the proposed Project access and circulation patterns. Therefore, existing street conditions along Via La Cresta have been evaluated to determine if additional traffic calming measures within the neighborhood would be necessary. As such, speed surveys were collected in November 2020 along Via La Cresta, between Twin Knolls Drive and Mystic Canyon Drive.

Table 12-1 summarizes the existing vehicular speed observed along Via La Cresta on an average weekday. Review of *Table 12-1* indicates that Via La Cresta experiences an 85th percentile speed of 27 mph. In general, it appears that the posted speed limit of 25 mph is adhered to. Additionally, review of *Figures 5-2 and 5-3* indicate that the proposed Project is anticipated to add only 23 trips in the AM peak hour and 27 trips in the PM peak hour along Via La Cresta which is considered a nominal amount of added trips. These added trips are not anticipated to affect the current speeds on the roadway. Therefore, based on the speeds data along with the minimal added Project trips, it can be concluded that traffic calming measures along Via La Cresta are not required.

Appendix B presents the existing daily traffic count and pedestrian data.

TABLE 12-1
EXISTING VEHICULAR SPEED AND TRAFFIC SUMMARY ON VIA LA CRESTA

Roadway Segment	Eastbound	Westbound	Combined East/West
	85 th Percentile Speed (mph)	85 th Percentile Speed (mph)	85 th Percentile Speed (mph)
A. Via La Cresta, between Twin Knolls Drive and Mystic Canyon Drive	27	27	27

13.0 ALTERNATIVE PROJECT ANALYSIS

An alternative analysis has been completed for the proposed Project based on the alternative site access option, which assumes that direct access to and from the project site would be provided via Shady View Drive and access from the extension of Via La Cresta will be restricted to “emergency use only”.

13.1 Alternative Project Traffic Generation, Distribution and Assignment

Figure 13-1 illustrates the general, directional traffic distribution pattern for the alternative access of the proposed Project. The anticipated AM and PM peak hour traffic volumes associated with the proposed Alternative Project are presented in *Figures 13-2* and *13-3*, respectively. The traffic volume assignments presented in *Figures 13-2* and *13-3* reflect the traffic distribution characteristics shown in *Figure 13-1* and the traffic generation forecast presented in *Table 5-1*.

Figures 13-4 and *13-5* present projected AM and PM peak hour traffic volumes at the six (6) key study intersections with the addition of the trips generated by the proposed Alternative Project to existing traffic volumes, respectively. *Figures 13-6* and *13-7* illustrate the Year 2024 forecast AM and PM peak hour traffic volumes with the inclusion of the trips generated by the proposed Alternative Project, respectively. *Figures 13-8* and *13-9* illustrate the Year 2040 forecast AM and PM peak hour traffic volumes with the inclusion of the trips generated by the proposed Alternative Project, respectively.

13.2 Peak Hour Intersection Capacity Analysis

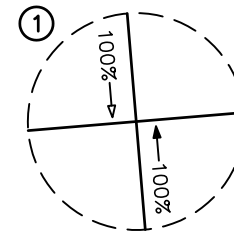
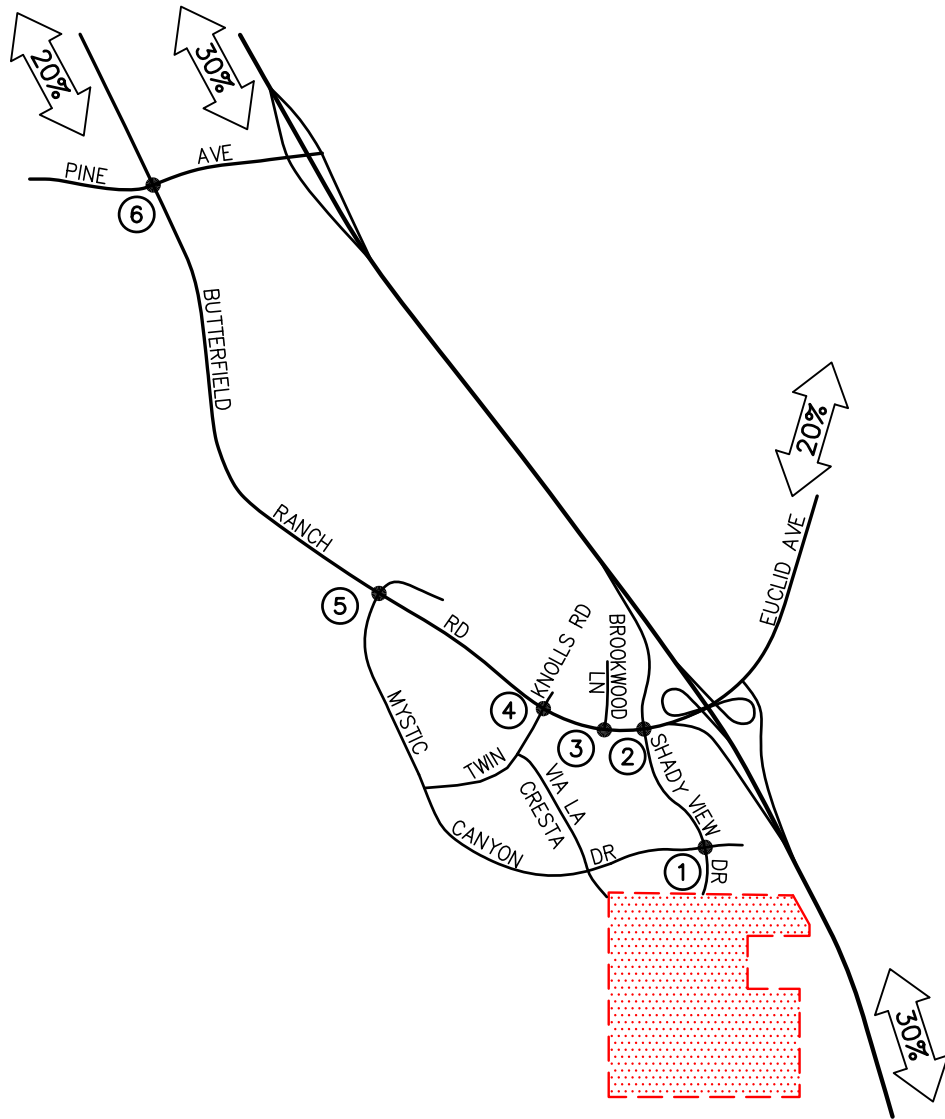
13.2.1 Existing With Project Traffic Analysis

Table 13-1 summarizes the peak hour level of service results at the six (6) key study intersections for Existing traffic conditions. The structure of this table is identical to that of *Table 8-1*.

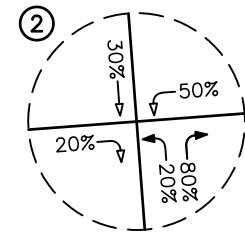
Existing With Project Traffic Conditions

Review of columns (2) and (3) of *Table 13-1* indicates that the traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City’s LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic.

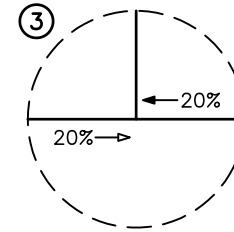
As shown in column (4) of *Table 13-1*, the implementation of recommended improvements at the intersection significantly impacted by the Project completely off-sets the impacts of the proposed Project as the improvements will offset the Project’s impacts based on the appropriate City’s impact criteria. As a result, the Project’s significant impacts under Existing With Project traffic conditions are reduced to a level of insignificance.



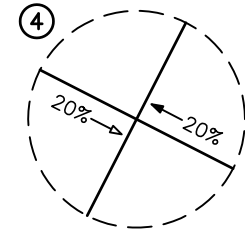
SHADY VIEW DR @
MYSTIC CANYON DR



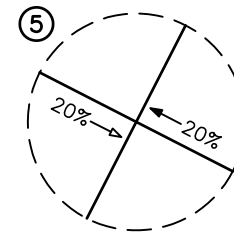
SHADY VIEW DR @
BUTTERFIELD RANCH RD



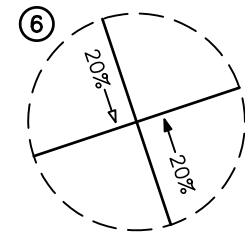
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

n:\4300\2204345 - shady view tia & vmt analysis, chino hills\dwg\4345 f13-1.dwg LDP 10:13:45 03-31-2021 aguilera



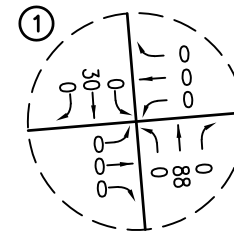
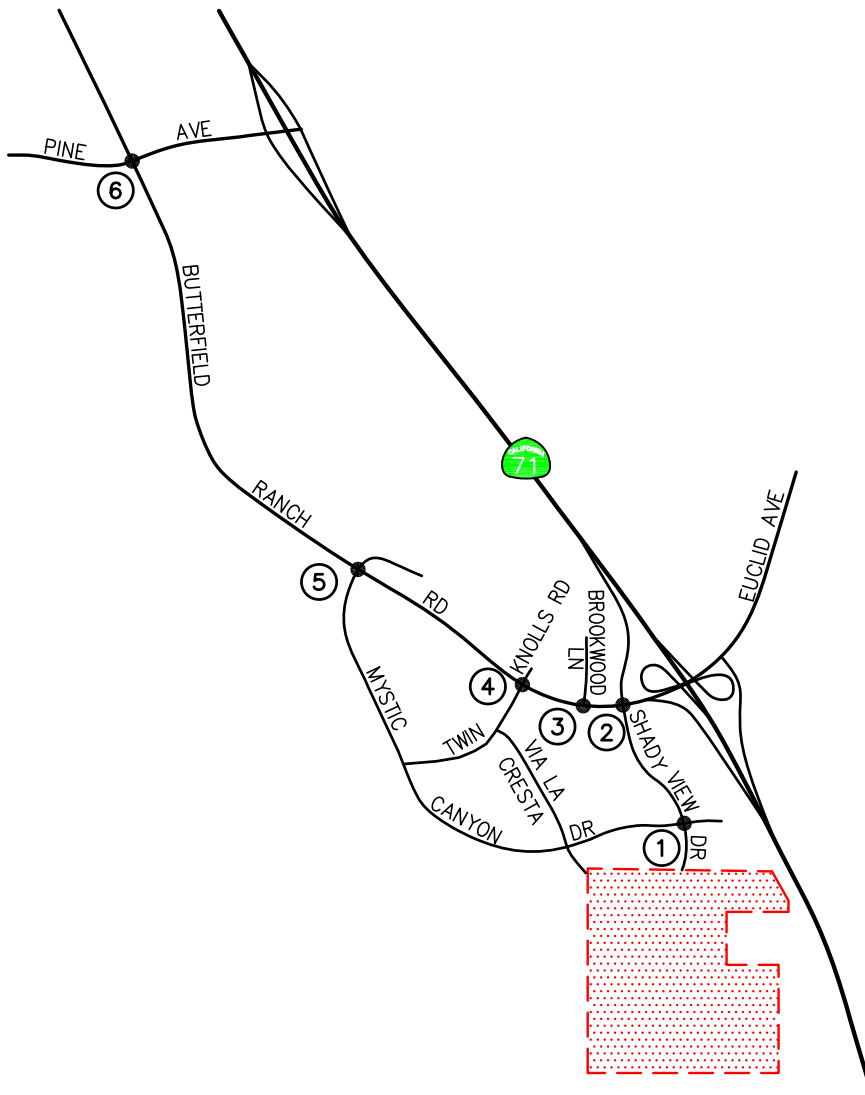
KEY

- ⊕ = STUDY INTERSECTION
- ← = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE
- ▨ = PROJECT SITE

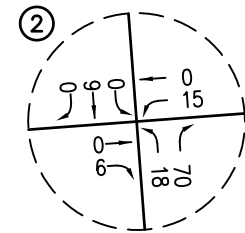
**ALTERNATIVE PROJECT TRIP DISTRIBUTION PATTERN
(VIA LA CRESTA EMERGENCY USE ONLY)**

SHADY VIEW PROJECT, CHINO HILLS

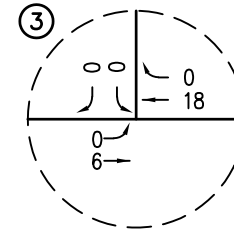
FIGURE 13-1



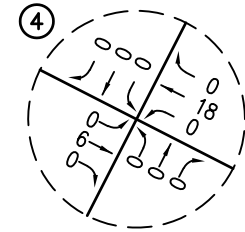
SHADY VIEW DR @
MYSTIC CANYON DR



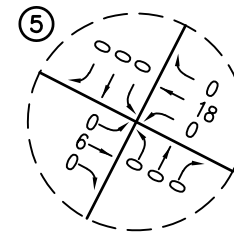
SHADY VIEW DR @
BUTTERFIELD RANCH RD



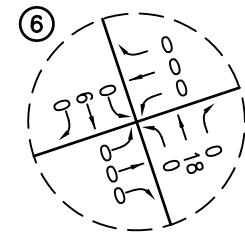
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD

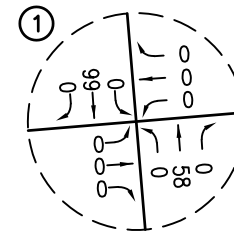
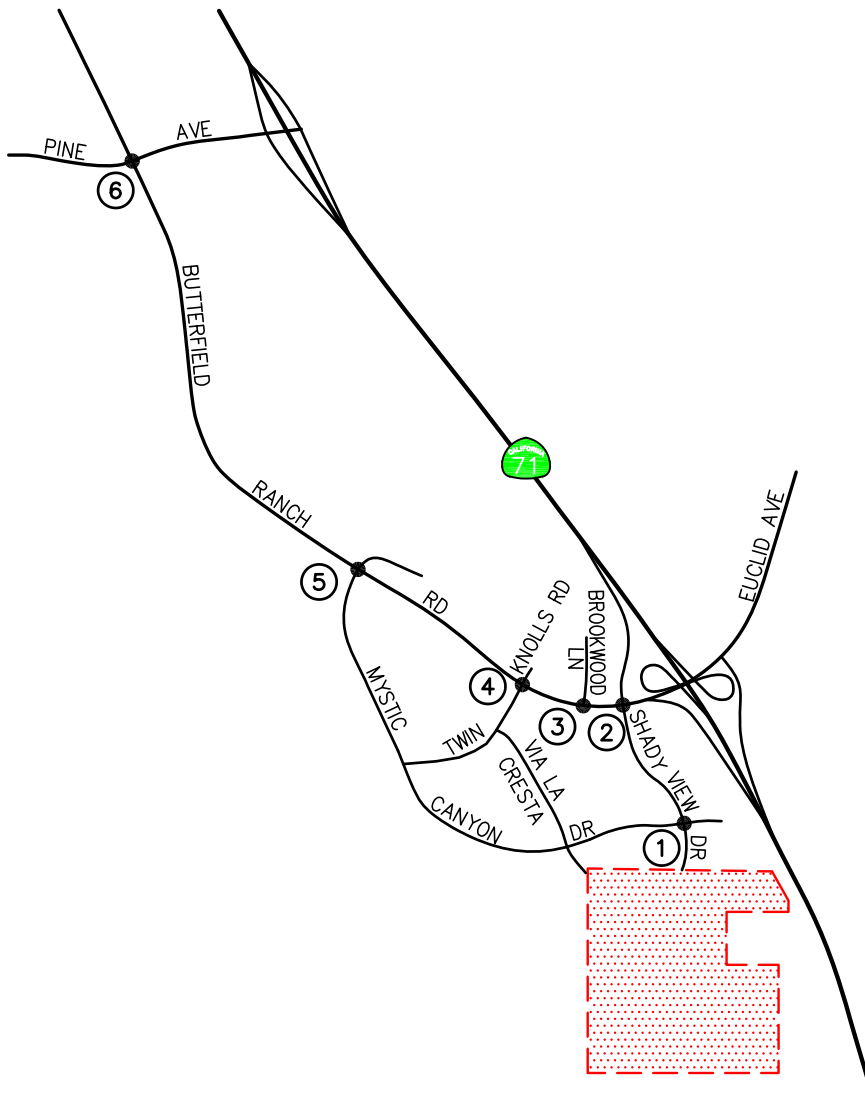


MYSTIC CANYON DR @
BUTTERFIELD RANCH RD

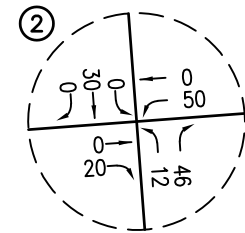


BUTTERFIELD RANCH RD @
PINE AVE

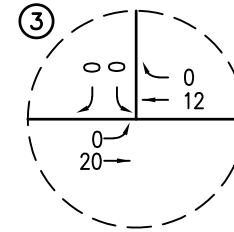
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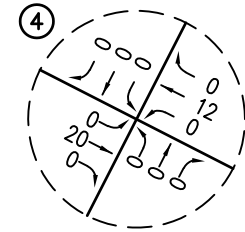
SHADY VIEW DR @
MYSTIC CANYON DR



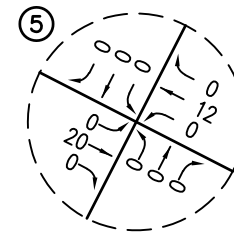
SHADY VIEW DR @
BUTTERFIELD RANCH RD



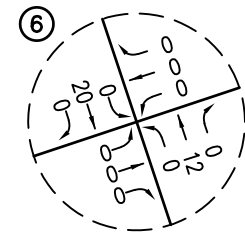
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



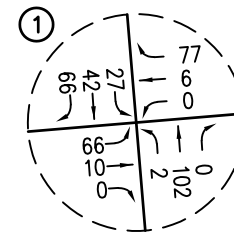
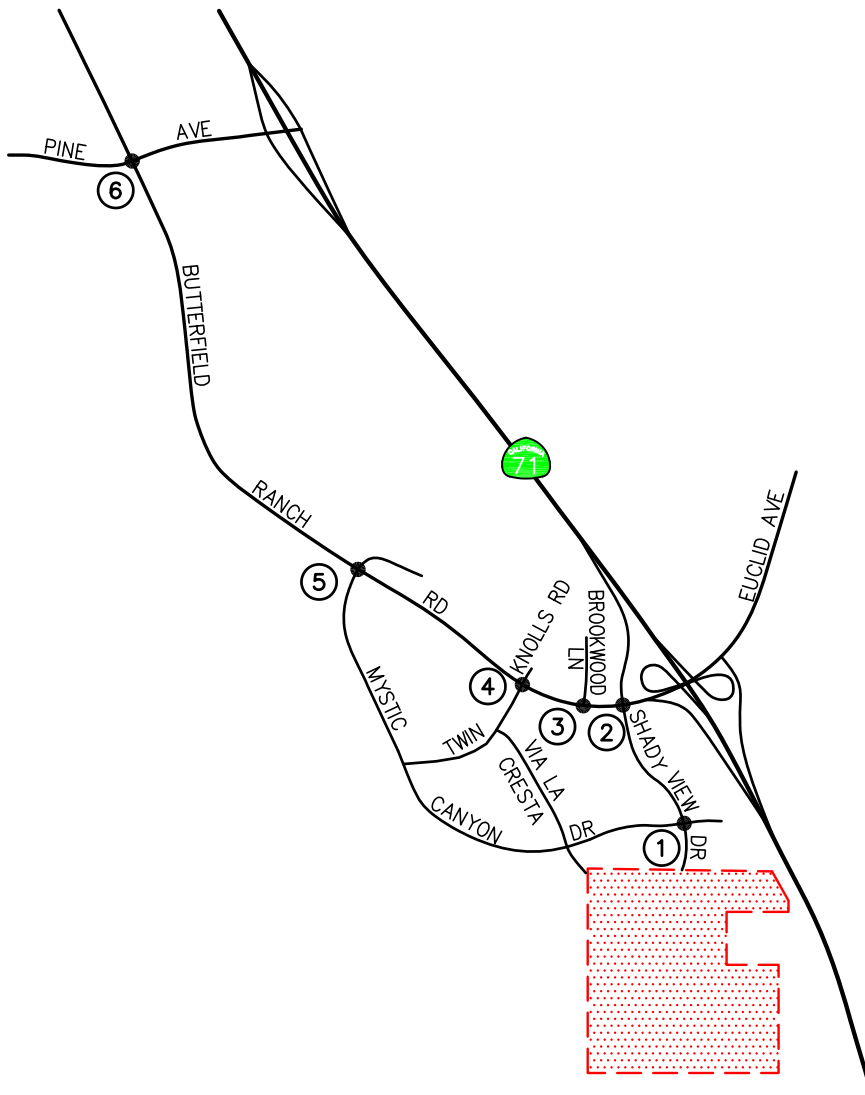
BUTTERFIELD RANCH RD @
PINE AVE

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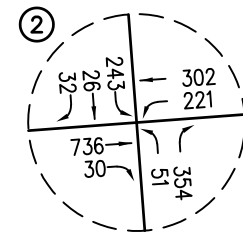


KEY
 # = STUDY INTERSECTION
 [Red Dotted Box] = PROJECT SITE

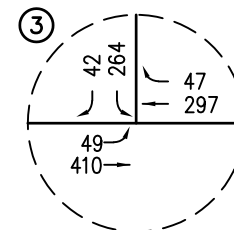
FIGURE 13-3
ALTERNATIVE PM PEAK HOUR
PROJECT ONLY TRAFFIC VOLUMES
 SHADY VIEW PROJECT, CHINO HILLS



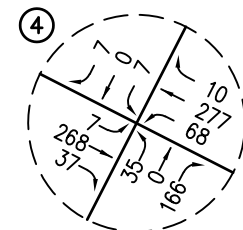
SHADY VIEW DR @
MYSTIC CANYON DR



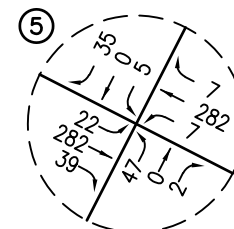
SHADY VIEW DR @
BUTTERFIELD RANCH RD



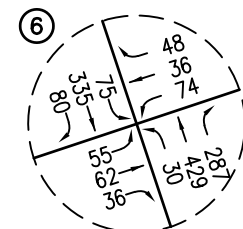
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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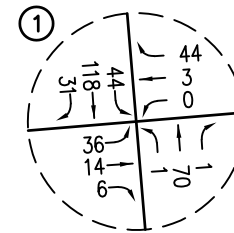
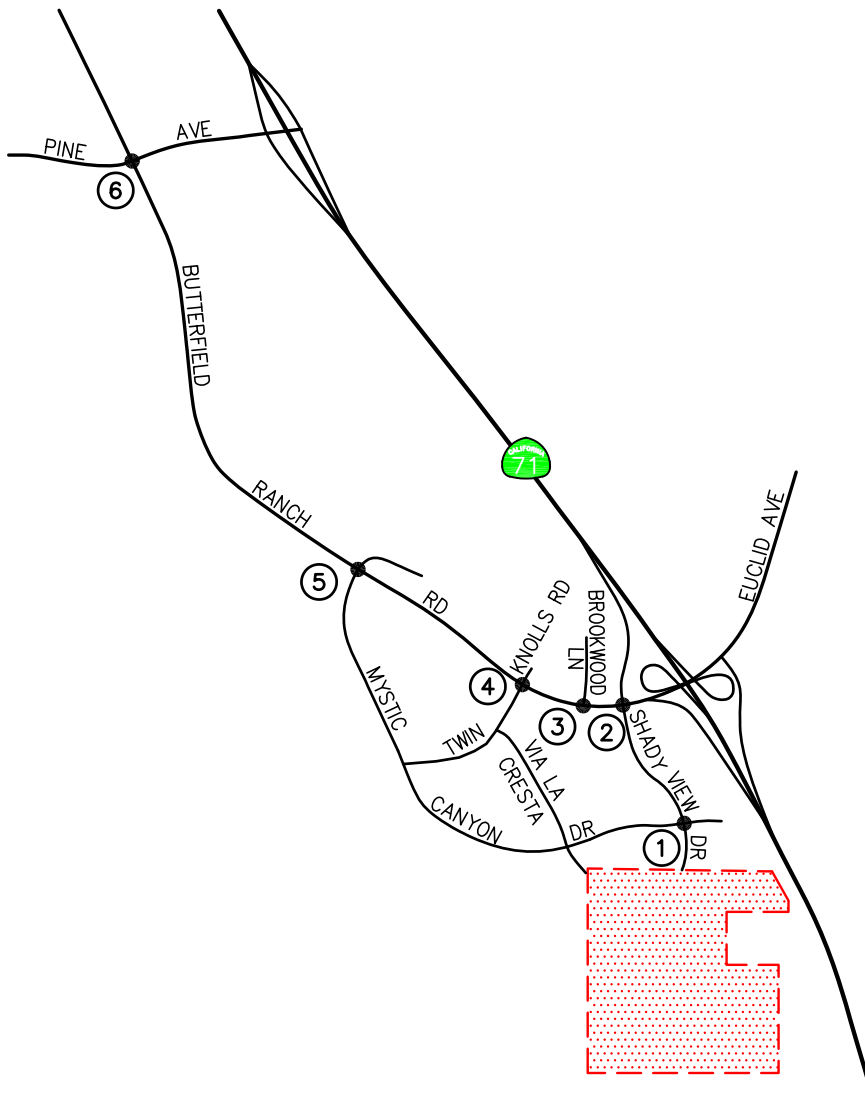
**LINSCOTT
LAW &
GREENSPAN**
engineers

KEY

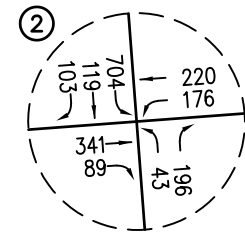
= STUDY INTERSECTION

= PROJECT SITE

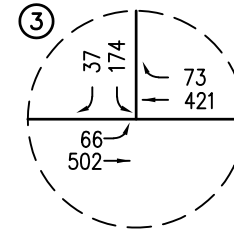
FIGURE 13-4
ALTERNATIVE EXISTING WITH PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



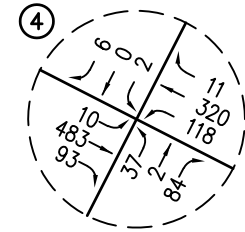
SHADY VIEW DR @
MYSTIC CANYON DR



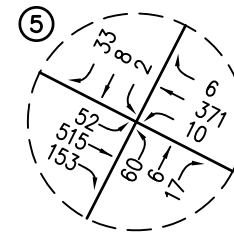
SHADY VIEW DR @
BUTTERFIELD RANCH RD



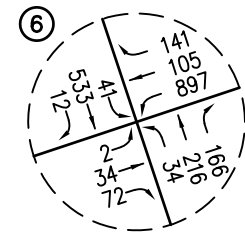
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD

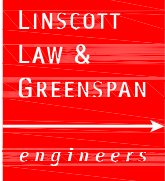


MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

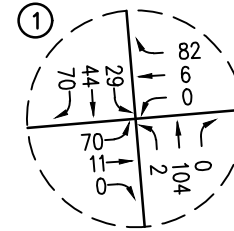
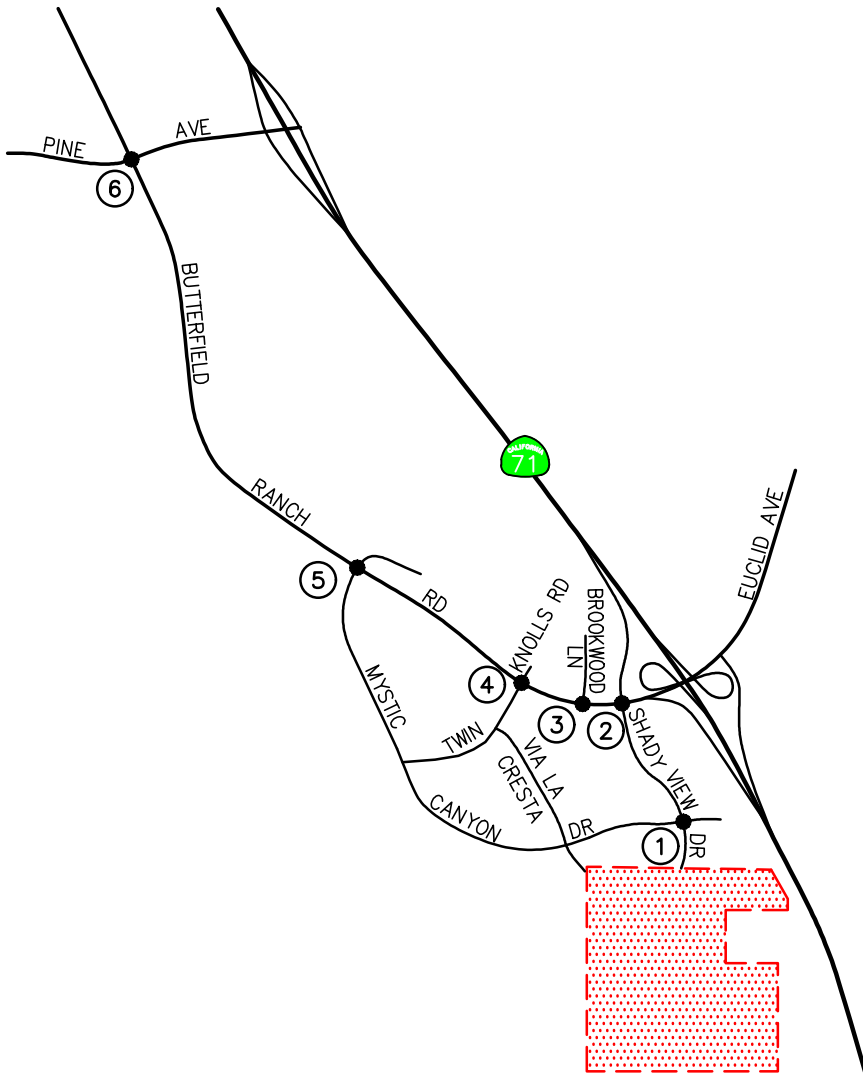
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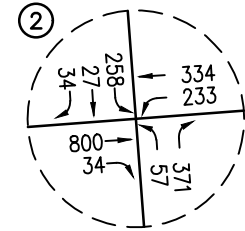
KEY
 # = STUDY INTERSECTION
 [Red Dotted Box] = PROJECT SITE

FIGURE 13-5

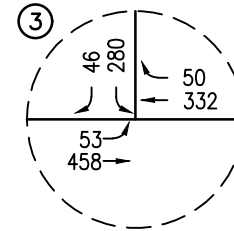
**ALTERNATIVE EXISTING WITH PROJECT
 PM PEAK HOUR TRAFFIC VOLUMES**
 SHADY VIEW PROJECT, CHINO HILLS



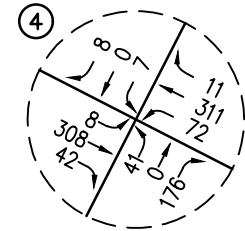
SHADY VIEW DR @
MYSTIC CANYON DR



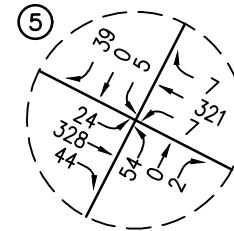
SHADY VIEW DR @
BUTTERFIELD RANCH RD



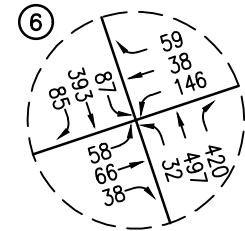
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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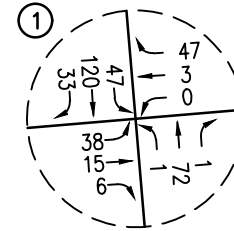
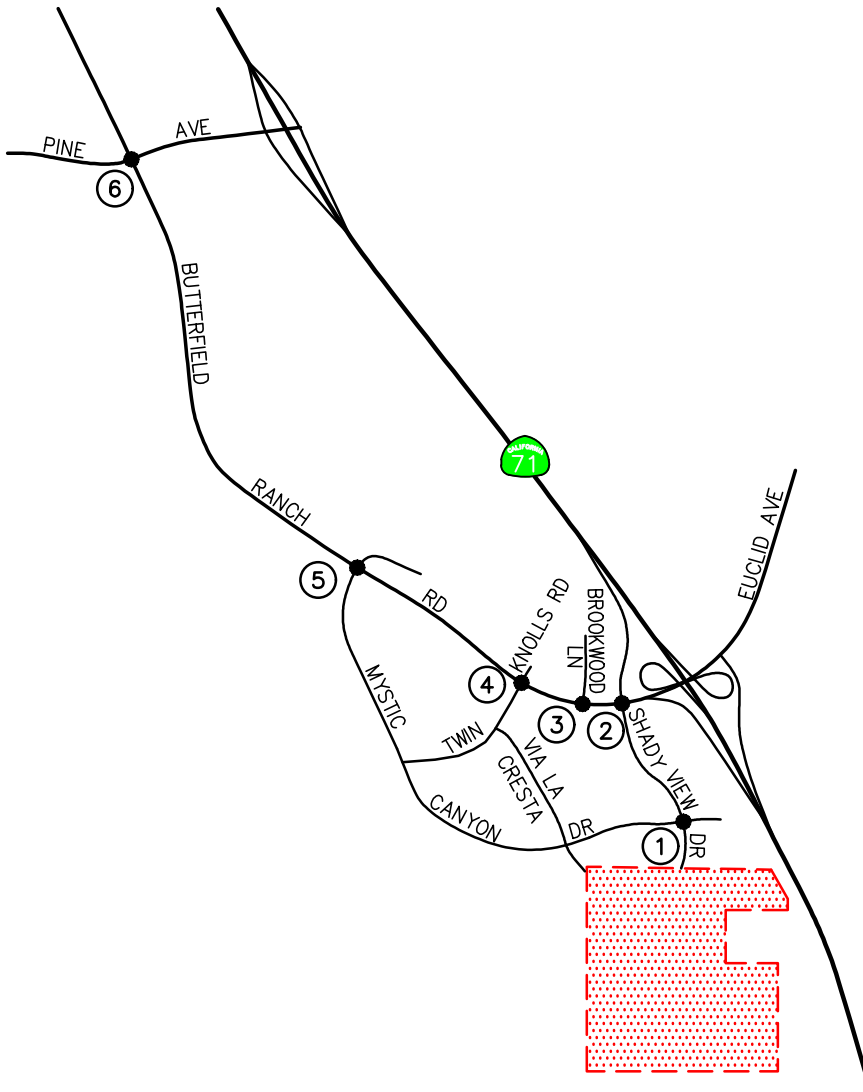
LINSCOTT
LAW &
GREENSPAN
engineers



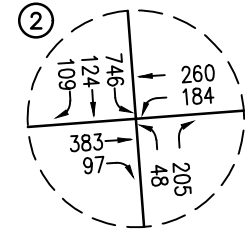
KEY
= STUDY INTERSECTION
[Red Hatched Box] = PROJECT SITE

FIGURE 13-6

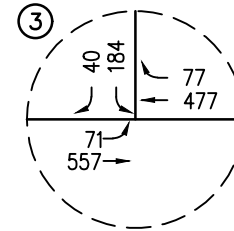
ALTERNATIVE YEAR 2024 WITH PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



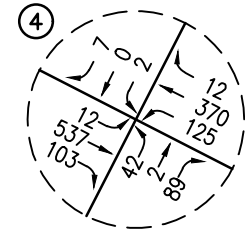
SHADY VIEW DR @
MYSTIC CANYON DR



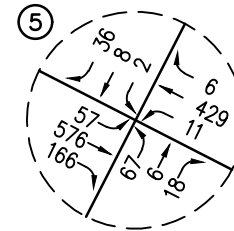
SHADY VIEW DR @
BUTTERFIELD RANCH RD



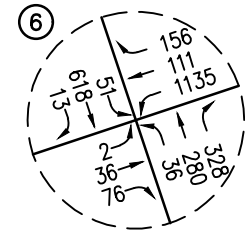
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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GREENSPAN
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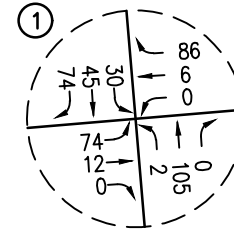
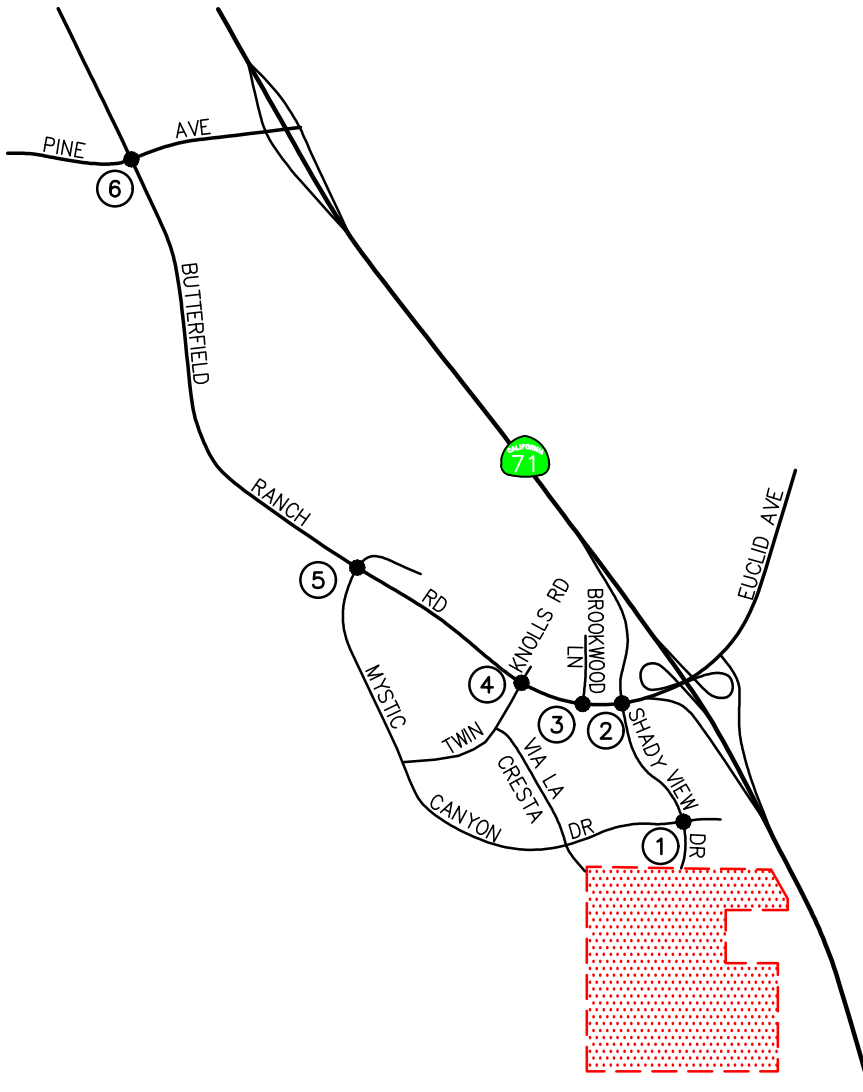
NO SCALE

KEY

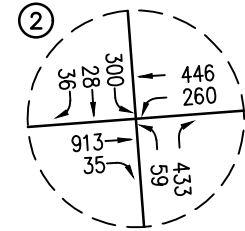
- ① = STUDY INTERSECTION
- ▨ = PROJECT SITE

FIGURE 13-7

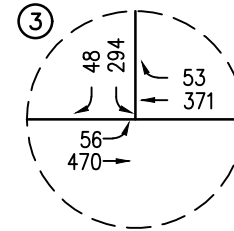
ALTERNATIVE YEAR 2024 WITH PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



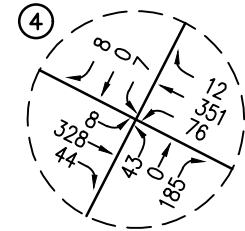
SHADY VIEW DR @
MYSTIC CANYON DR



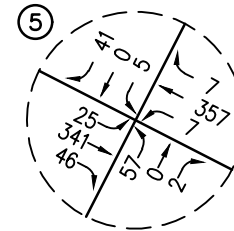
SHADY VIEW DR @
BUTTERFIELD RANCH RD



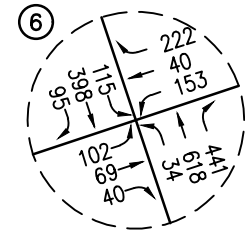
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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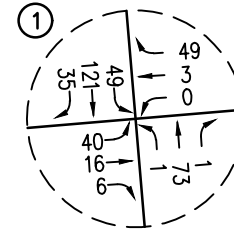
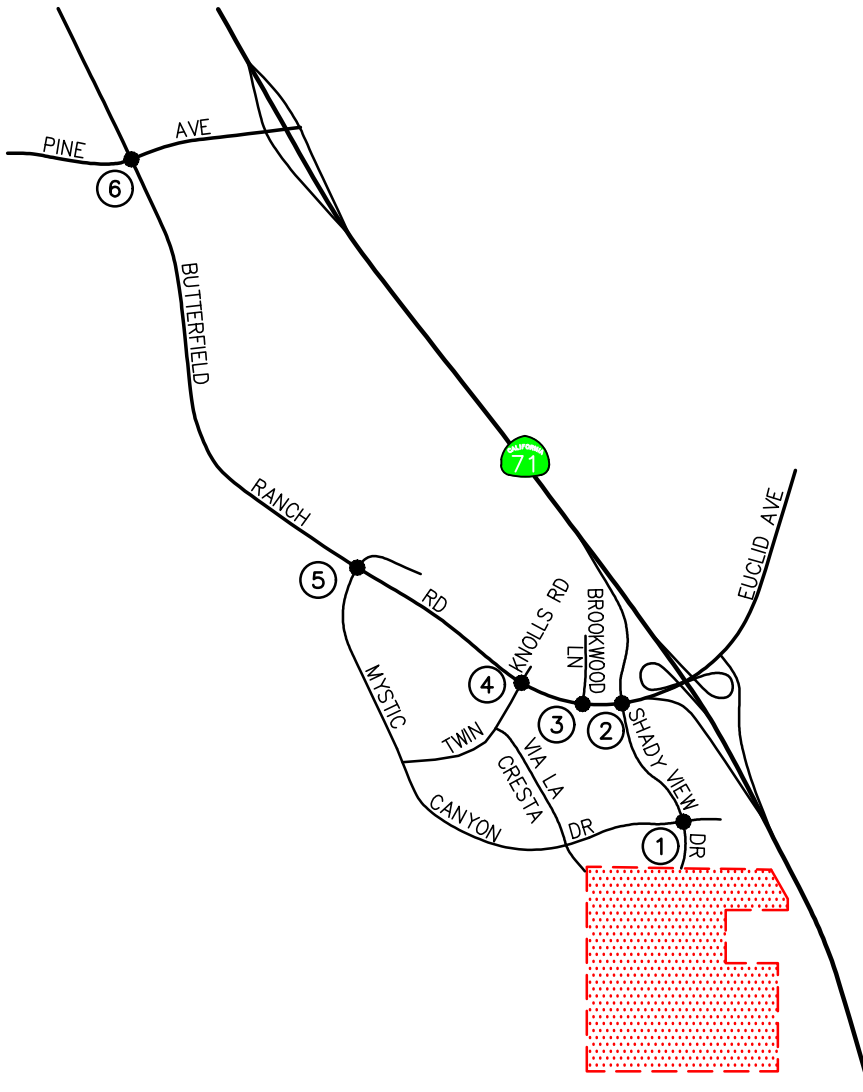
LINSCOTT
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GREENSPAN
engineers



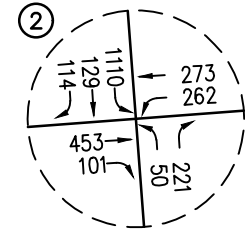
KEY
= STUDY INTERSECTION
[Red Dotted Box] = PROJECT SITE

FIGURE 13-8

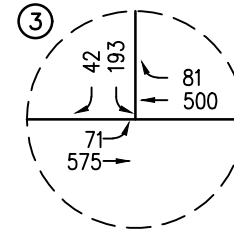
ALTERNATIVE YEAR 2040 WITH PROJECT
AM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS



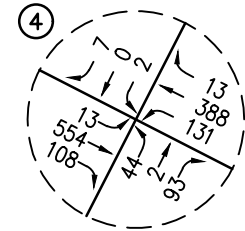
SHADY VIEW DR @
MYSTIC CANYON DR



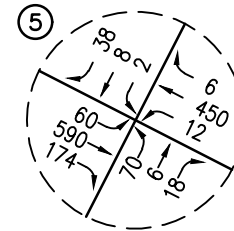
SHADY VIEW DR @
BUTTERFIELD RANCH RD



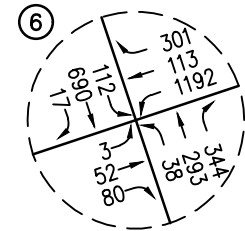
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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NO SCALE

KEY

- = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 13-9

ALTERNATIVE YEAR 2040 WITH PROJECT
PM PEAK HOUR TRAFFIC VOLUMES
SHADY VIEW PROJECT, CHINO HILLS

Additionally, queues for the SR-71 SB Off-Ramp were reviewed and are considered adequate under Existing With Project traffic conditions with the implementation of recommended mitigation measures.

Appendix H presents the Alternative Project Analysis Delay/LOS/Queuing calculations for the key study intersections for the AM peak hour and PM peak hour.

13.2.2 Year 2024 Traffic Analysis

Table 13-2 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 structure of this table is identical to that of *Table 8-2*.

Year 2024 Without Project Traffic Conditions

Level of service results for Year 2024 without project traffic conditions, as presented in column 2 of *Table 13-2*, are identical to the results previously presented in *Table 8-2*.

Year 2024 With Project Traffic Conditions

Review of columns (3) and (4) of *Table 13-2* indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City's LOS standards and impact criteria.

Review of columns (3) and (4) of *Table 13-2* indicates that traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City's LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic.

As shown in column (5) of *Table 13-2*, the implementation of recommended improvements at the intersection significantly impacted by the Project completely off-sets the impacts of the proposed Project and future background traffic as the improvements will offset the Project's impacts based on the appropriate City's impact criteria. As a result, the Project's significant cumulative impacts under Year 2024 With Project traffic conditions are reduced to a level of insignificance.

Additionally, queues for the SR-71 SB Off-Ramp were reviewed and are considered adequate under Year 2024 With Project traffic conditions with the implementation of recommended mitigation measures.

Appendix H presents the Alternative Project Analysis Delay/LOS/Queuing calculations for the key study intersections for the AM peak hour and PM peak hour.

13.2.3 Year 2040 Traffic Analysis

Table 13-3 summarizes the weekday AM peak hour and PM peak Level of Service results at the six (6) key study intersections for the Year 2040. The structure of this table is identical to that of *Table 8-3*.

Year 2040 Without Project Traffic Conditions

Level of service results for Year 2040 without project traffic conditions, as presented in column 2 of *Table 13-3*, are identical to the results previously presented in *Table 8-3*.

Year 2040 With Project Traffic Conditions

Review of columns (3) and (4) of *Table 13-3* indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City's LOS standards and impact criteria.

Review of columns (3) and (4) of *Table 13-3* indicates that traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City's LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic.

As shown in column (5) of *Table 13-3*, the implementation of the recommended mitigation measures, the Project's cumulative impacts under long-term (Year 2040) traffic conditions are reduced to a level of insignificance as the improvements will offset the Project's impacts based on the City's impact criteria. As a result, the Project's cumulative impacts under Year 2040 With Project traffic conditions are reduced to a level of insignificance.

Additionally, queues for the SR-71 SB Off-Ramp were reviewed and are considered adequate under Year 2040 With Project traffic conditions with the implementation of recommended mitigation measures.

Appendix H presents the Alternative Project Analysis Delay/LOS/Queuing calculations for the key study intersections for the AM peak hour and PM peak hour.

TABLE 13-1
ALTERNATIVE EXISTING WITH PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Existing With Alternative Project Traffic Conditions			(3) Significant Impact			(4) Existing With Alternative Project With Mitigation		
		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	8.4	0.207	A	0.6	0.056	No	--	--	--
	PM	7.6	0.142	A	8.7	0.305	A	1.1	0.163	No	--	--	--
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	57.7	0.752	E	18.8	0.037	Yes	24.6	0.701	C
	PM	46.1	0.619	D	53.4	0.696	D	7.3	0.077	No	44.2	0.560	D
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.3	0.346	B	0.0 ²⁵	0.002	No	--	--	--
	PM	11.0	0.326	B	10.8	0.330	B	0.0 ²⁵	0.004	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	14.6	0.032	B	0.3	0.002	No	--	--	--
	PM	23.0	0.013	C	24.3	0.014	C	1.3	0.001	No	--	--	--
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.8	0.155	D	0.3	0.002	No	--	--	--
	PM	30.4	0.303	C	30.1	0.311	C	0.0 ²⁵	0.008	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	17.7	0.360	B	0.0 ²⁵	0.000	No	--	--	--
	PM	33.6	0.600	C	33.4	0.607	C	0.0 ²⁵	0.007	No	--	--	--

Note:

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

²⁵ Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.0 s/v.

TABLE 13-2
ALTERNATIVE YEAR 2024 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Year 2024 Without Project Traffic Conditions			(3) Year 2024 With Alternative Project Traffic Conditions			(4) Significant Impact			(5) Year 2024 With Alternative 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	8.1	0.177	A	0.5	0.043	No	--	--	--
	PM	7.6	0.142	A	7.5	0.120	A	8.2	0.247	A	0.7	0.127	No	--	--	--
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	42.0	0.731	D	61.5	0.771	E	19.5	0.040	Yes	24.5	0.711	C
	PM	46.1	0.619	D	49.8	0.633	D	56.0	0.715	E	6.2	0.082	Yes	45.4	0.575	D
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.1	0.353	B	15.0	0.355	B	0.0 ²⁶	0.002	No	--	--	--
	PM	11.0	0.326	B	10.7	0.330	B	10.6	0.334	B	0.0 ²⁶	0.004	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	13.9	0.132	B	14.2	0.136	B	0.3	0.004	No	--	--	--
	PM	23.0	0.013	C	25.2	0.014	D	26.6	0.015	D	1.4	0.001	No	--	--	--
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.4	0.157	D	36.7	0.159	D	0.3	0.002	No	--	--	--
	PM	30.4	0.303	C	30.5	0.303	C	30.3	0.309	C	0.0 ²⁶	0.006	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	18.1	0.435	B	18.0	0.435	B	0.0 ²⁶	0.000	No	--	--	--
	PM	33.6	0.600	C	60.1	0.734	E	59.7	0.741	E	0.0 ²⁶	0.007	No	--	--	--

Note:

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

²⁶ Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.0 s/v.

TABLE 13-3
ALTERNATIVE YEAR 2040 PEAK HOUR INTERSECTION CAPACITY ANALYSIS

Key Intersections	Time Period	(1) Existing Traffic Conditions			(2) Year 2040 Without Project Traffic Conditions			(3) Year 2040 With Alternative Project Traffic Conditions			(4) Significant Impact			(5) Year 2040 With Alternative 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	7.7	0.142	A	8.2	0.185	A	0.5	0.043	No	--	--	--
	PM	7.6	0.142	A	7.5	0.128	A	8.3	0.255	A	0.8	0.127	No	--	--	--
2. Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road	AM	38.9	0.715	D	53.9	0.785	D	74.2	0.834	E	20.3	0.049	Yes	23.9	0.763	C
	PM	46.1	0.619	D	110.6	0.802	F	133.0	0.880	F	22.4	0.078	Yes	101.5	0.725	F
3. Brookwood Lane at Butterfield Ranch Road	AM	15.4	0.344	B	15.0	0.346	B	14.8	0.348	B	0.0 ²⁷	0.002	No	--	--	--
	PM	11.0	0.326	B	10.7	0.327	B	10.6	0.330	B	0.0 ²⁷	0.003	No	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	AM	14.3	0.030	B	14.9	0.030	B	15.3	0.031	C	0.4	0.001	No	--	--	--
	PM	23.0	0.013	C	28.5	0.016	D	30.3	0.016	D	1.8	0.000	No	--	--	--
5. Mystic Canyon Drive at Butterfield Ranch Road	AM	36.5	0.153	D	36.6	0.155	D	36.9	0.157	D	0.3	0.002	No	--	--	--
	PM	30.4	0.303	C	30.5	0.296	C	30.3	0.302	C	0.0 ²⁷	0.006	No	--	--	--
6. Butterfield Ranch Road at Pine Avenue	AM	17.9	0.360	B	22.4	0.450	C	22.3	0.450	C	0.0 ²⁷	0.000	No	--	--	--
	PM	33.6	0.600	C	56.3	0.750	E	56.0	0.756	E	0.0 ²⁷	0.006	No	--	--	--

Note:

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

²⁷ Theoretical negative increase, which is possible with HCM 6 calculations, is denoted as an increase of 0.000 or 0.0 s/v.

13.3 Recommended Improvements

For the intersections where projected traffic volumes are expected to result in poor operating conditions, this report recommends (identifies) improvements, which change the intersection geometry to increase capacity. These capacity improvements usually involve roadway widening and/or restriping to reconfigure or add lanes to various approaches of a key intersection. The proposed improvements are expected to offset the impact of future traffic and improve Levels of Service to an acceptable range and/or to pre-Project conditions.

Transportation improvements throughout San Bernardino County are funded through a combination of direct Project mitigation, fair share contributions or development impact fee programs. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

13.3.1 Existing With Project Recommended Improvements

The following improvements listed below have been identified to off-set the Project's significant traffic impacts for Existing With Project traffic conditions. The Project can be expected to construct the recommended improvements:

- **No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road:** *(Improvements identical to those identified in Section 10.2)* Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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)*.

13.3.2 Year 2024 With Project Recommended Improvements

The following improvements listed below have been identified to off-set the Project's significant traffic impacts for Year 2024 With Project traffic conditions. The Project can be expected to construct the recommended improvements:

- **No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road:** *(Improvements identical to those identified in Section 10.1.2)* Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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)*.

13.3.3 Year 2040 With Project Recommended Improvements

The following improvements listed below have been identified to off-set projected long-term significant traffic impacts of the Project for Year 2040 With Project traffic conditions. The Project can be expected to construct the recommended improvements:

- **No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road:** *(Improvements identical to those identified in Sections 10.1.2 and 10.1.3)* Restripe the

eastbound approach to include an exclusive right-turn pocket. Modify 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).

Figure 10-1 graphically illustrates the recommended improvements at the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2) for Existing With Project, Year 2024 With Project, and Year 2040 With Project traffic conditions.

13.4 Improvement Costs

Since the recommended improvements at the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2) for the Alternative Project are identical to those identified in Section 10.1, the improvement costs are identical to those identified in Section 10.2. *Table 10-1* presents the recommended improvements at the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2) and their respective costs needed by relevant study years to maintain acceptable service levels based on the LOS standards defined in this report. *Table 10-1* provides order of magnitude cost estimates for these improvements and are subject to change based on future detailed engineering estimates.

13.4.1 Year 2024 With Project Improvement Costs

As presented in column (1) of *Table 10-1*, the cost to implement recommended intersection improvements identified in this report to off-set the Year 2024 With Project traffic impacts at the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2) is estimated to total **\$100,000.00**.

13.4.2 Year 2040 With Project Improvement Costs

As presented in column (2) of *Table 10-1*, the cost to implement recommended intersection improvements identified in this report to off-set the Year 2040 With Project traffic impacts at the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2) amounts to **\$0.00** since the mitigation measures are identical to that recommended for Year 2024 With Project conditions.

14.0 SUMMARY OF FINDINGS AND CONCLUSIONS

- **Project Location** – The Project site is a 130-acre vacant parcel of land 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.
- **Project Description** – The Project applicant is proposing to develop a new 159 DU single-family residential community to include a community center and approximately 72-acres of association-maintained open space. Vehicular access to the proposed Project will be provided via the proposed extension of Shady View Drive and Via La Cresta from its current southerly terminus into the Project site to connect to a proposed local residential network of streets.

Per the direction of City staff, an alternative assessment assuming access from the extension of Via La Cresta will be restricted to “emergency use only”.

- **Study Scope** – The six (6) study intersections were selected for evaluation utilizing CMP analysis criteria and requirements of the City of Chino Hills (i.e. “50 peak hour trip criterion”), as well as proximity to the Project site. The six (6) existing key study intersections listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. The jurisdictions where the study intersections are located are identified as well:

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

Detailed peak hour level of service analyses were prepared at the above locations under the Existing traffic conditions, Existing With Project traffic conditions, Year 2024 Without Project traffic conditions, Year 2024 With Project traffic conditions, Year 2040 Without Project traffic conditions and Year 2040 With Project traffic conditions. The Scope of Work for this Project was confirmed with City staff and satisfies the City of Chino Hills requirements as outlined the *Traffic Impact Study Guidelines for Development Projects in the City of Chino Hills (dated 10/15/01)*.

- **Existing Traffic Conditions** – The six (6) key study intersections currently operate at an acceptable level of service during the AM and PM peak hours.

- ***Project Trip Generation*** –The proposed Project is forecast to generate 1,501 weekday daily trips (one half arriving, one half departing), with 118 trips (30 inbound, 88 outbound) produced during the AM peak hour and 157 trips (99 inbound, 58 outbound) produced during the PM peak hour.
- ***Related Projects Traffic Characteristics*** – Twenty-three (23) related projects located within the City of Chino Hills and City of Chino were considered as part of the cumulative background setting. Although not all related projects are expected to be completed and occupied by Year 2024, the traffic analysis assumes otherwise to provide a conservative traffic assessment for near-term cumulative traffic conditions. The twenty-three (23) related projects included in the Year 2024 traffic conditions would generate a total of 27,105 daily trips, with 1,510 trips (799 inbound and 711 outbound) forecast during the AM peak hour and 2,241 trips (1,100 inbound and 1,141 outbound) forecast during the PM peak hour.
- ***Existing With Project Traffic Conditions*** – The results of the traffic impact analysis indicates that the proposed Project will not have a significant impact at any of the six (6) key study intersections. All of the key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic.

Although the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4) is not forecast to operate adversely, the study intersection satisfies the criteria for a traffic signal. As such, a traffic signal is included as a circulation enhancement and will help improve the level of service during both the AM and PM peak hours.

- ***Year 2024 With Project Traffic Conditions*** – The results of the traffic impact analysis indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City’s LOS standards and impact criteria.

Traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City’s LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic. The implementation of recommended improvements at the intersection significantly impacted by the Project completely off-sets the impacts of the proposed Project and future background traffic as the improvements will offset the Project’s impacts based on the appropriate City’s impact criteria. As a result, the Project’s significant cumulative impacts under Year 2024 With Project traffic conditions are reduced to a level of insignificance.

Although the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4) is not forecast to operate adversely, the study intersection satisfies the criteria for a traffic signal.

As such, a traffic signal is included as a circulation enhancement and will help improve the level of service during both the AM and PM peak hours.

- ***Year 2040 With Project Traffic Conditions*** – The results of the traffic impact analysis indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City’s LOS standards and impact criteria.

Traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City’s LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic. The implementation of the recommended mitigation measures, the Project’s cumulative impacts under long-term (Year 2040) traffic conditions are reduced to a level of insignificance as the improvements will offset the Project’s impacts based on the City’s impact criteria. As a result, the Project’s cumulative impacts under Year 2040 With Project traffic conditions are reduced to a level of insignificance.

Although the intersection of Twin Knolls Drive at Butterfield Ranch Road (Intersection No. 4) is not forecast to operate adversely, the study intersection satisfies the criteria for a traffic signal. As such, a traffic signal is included as a circulation enhancement and will help improve the level of service during both the AM and PM peak hours.

- ***Traffic Signal Warrant Assessment*** – Based on the existing traffic and pedestrian volumes, current intersection geometrics, and review of the accident data, the intersection of Twin Knolls Drive and Butterfield Ranch Road (Intersection No. 4) satisfies the criteria for a traffic signal based on Warrants No. 1, 2 and 3. As such, it is recommended to install a traffic signal at Twin Knolls Drive and Butterfield Ranch Road. Signalizing the intersection will help improve traffic flow and pedestrian connectivity within the adjacent Butterfield Ranch neighborhoods. Given that future operating conditions at the intersection of Shady View Drive/SR-71 SB Off-Ramp and Butterfield Ranch Road are forecast to deteriorate to LOS F conditions, it is likely that Twin Knolls Drive would be more attractive to motorists who wish to bypass congestion and traffic delays at this location. Furthermore, taking into consideration the proximity to adjacent traffic signals, the proposed traffic signal could be easily integrated into the existing traffic signal network and thus would not result in undue congestion.
- ***Existing With Project Recommended Intersections Circulation Enhancements*** – The following improvements listed below have been identified to off-set the Project’s significant traffic impacts for Existing With Project traffic conditions. The Project can be expected to construct the recommended circulation enhancements:

- No. 4 – Twin Knolls Drive at Butterfield Ranch Road: Install a two-phase traffic signal. Additional improvements beyond those required for construction/installation of a 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 need to conform to the City of Chino Hills Standard Design Guidelines and/or *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The City will require the recommended installation of a traffic signal at this location as a condition of Project approval.

- ***Year 2024 Recommended Intersections Improvements and/or Circulation Enhancements*** – The following improvements listed below have been identified to off-set the Project’s significant traffic impacts for Year 2024 With Project traffic conditions. The Project can be expected to construct the recommended improvements and circulation enhancements:
 - No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road: Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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).
 - No. 4 – Twin Knolls Drive at Butterfield Ranch Road: *(Circulation Improvements identical to those identified in Existing Plus Project)* Install a two-phase traffic signal. Additional improvements beyond those required for construction/installation of a 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 need to conform to the City of Chino Hills Standard Design Guidelines and/or *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The City will require the recommended installation of a traffic signal at this location as a condition of Project approval.

- ***Year 2040 Recommended Intersection Improvements and/or Circulation Enhancements*** – The following improvements listed below have been identified to off-set projected long-term significant traffic impacts of the Project for Year 2040 With Project traffic conditions. The Project can be expected to construct the recommended improvements and circulation enhancements:
 - No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road: *(Improvements identical to those identified in Year 2024 Plus Project)* Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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).
 - No. 4 – Twin Knolls Drive at Butterfield Ranch Road: *(Circulation Improvements identical to those identified in Existing Plus Project)* Install a two-phase traffic signal.

Additional improvements beyond those required for construction/installation of a 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 need to conform to the City of Chino Hills Standard Design Guidelines and/or *California Manual on Uniform Traffic Control Devices* (CA MUTCD). The City will require the recommended installation of a traffic signal at this location as a condition of Project approval.

- ***City of Chino Hills Traffic-Related Development Impact Fee (DIF) Requirement*** – The proposed Project results in a preliminary estimate of \$40,068.00 attributable to the Traffic Facilities Fee and \$88,181.40 attributable to the Traffic Impact Fee. The precise fee will be collected prior to the issuance of building permits by the City of Chino Hills.
- ***Alternative Existing With Project Traffic Conditions*** – The results of the traffic impact analysis indicates that the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City’s LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic. The implementation of recommended improvements at the intersection significantly impacted by the Project completely off-sets the impacts of the proposed Project as the improvements will offset the Project’s impacts based on the appropriate City’s impact criteria. As a result, the Project’s significant impacts under Existing With Project traffic conditions are reduced to a level of insignificance.
- ***Alternative Year 2024 With Project Traffic Conditions*** – The results of the traffic impact analysis indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City’s LOS standards and impact criteria.

Traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City’s LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic. The implementation of recommended improvements at the intersection significantly impacted by the Project completely off-sets the impacts of the proposed Project and future background traffic as the improvements will offset the Project’s impacts based on the appropriate City’s impact criteria. As a result, the Project’s significant cumulative impacts under Year 2024 With Project traffic conditions are reduced to a level of insignificance.

- ***Alternative Year 2040 With Project Traffic Conditions*** – The results of the traffic impact analysis indicates that traffic associated with the proposed Project will have a contributory impact at one (1) of the six (6) key study intersections. Butterfield Ranch Road at Pine Avenue (Intersection No. 6) is forecast to operate at LOS E without and with the Project. However, the proposed Project is expected to add less than 0.01 to the volume-to-capacity ratio at this location and therefore is considered less than significant based on the City’s LOS standards and impact criteria.

Traffic associated with the proposed Project will have a significant impact at one (1) of the six (6) key study intersections. At the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2), Project-related traffic is forecast to significantly impact the intersection based on the City’s LOS standard and impact criteria. The remaining key study intersections are forecast to operate at an acceptable LOS or remain the same with the addition of Project generated traffic. The implementation of the recommended mitigation measures, the Project’s cumulative impacts under long-term (Year 2040) traffic conditions are reduced to a level of insignificance as the improvements will offset the Project’s impacts based on the City’s impact criteria. As a result, the Project’s cumulative impacts under Year 2040 With Project traffic conditions are reduced to a level of insignificance.

- ***Alternative Recommended Intersections Improvements*** – The recommended intersection improvements at the intersection of Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road (Intersection No. 2) for the alternative project analysis are identical to the improvements identified for the primary analysis, which include the following for Existing With Project, Year 2024 With Project, and Year 2040 With Project traffic conditions:
 - No. 2 – Shady View Drive/SR-71 SB Off-Ramp at Butterfield Ranch Road: Restripe the eastbound approach to include an exclusive right-turn pocket. Modify 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 Project can be expected to construct the recommended improvements.

APPENDIX A

TRAFFIC IMPACT STUDY SCOPE OF WORK

MEMORANDUM

To: Ryan Gackstetter, Senior Planner
City of Chino Hills
Community Development Department

Date: December 16, 2020

CC: Joe Dyer, Assistant City Engineer
City of Chino Hills – Public Works/Engineering

From: Richard E. Barretto, P.E., Principal
Shane Green, P.E., Senior Transportation Engineer
LLG Ref: 2.20.4345.1
Linscott, Law & Greenspan, Engineers

Subject: ***Traffic Impact Analysis Scope of Work for the Proposed Shady View Residential Project – Chino Hills, California***

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the following Traffic Impact Analysis Scope of Work for the proposed Shady View project in the City of Chino Hills. The work program summarized below considers the City of Chino Hills requirements and work program included in the City's RFP for the Project, as well as our recent experience within the City. Based on our understanding of the Project, the preparation of a traffic impact analysis is required as part of the entitlement process for this Project to assess conformance with the goals and policies of the Circulation Element of the General Plan.

Traffic Impact Analysis Report Scope of Work

The Traffic Impact Analysis for the proposed Shady View project (hereinafter referred to as Project) will satisfy the traffic impact requirements of the City of Chino Hills as outlined in the *Traffic Impact Study Guidelines for Development Projects in the City of Chino Hills (dated 10/15/01)* and be consistent with the current *Congestion Management Program for San Bernardino County, 2016 Update Traffic Impact Analysis Report Guidelines*.

- A. Project Location:** The Project site is a 130-acre vacant parcel of land 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. See attached **Figure 1-1**, a Vicinity Map that illustrates the general location of the Project and surrounding street system. **Figure 2-1** presents an aerial of the site.
- B. Project Description:** The Project applicant is proposing to develop a new 159 DU single-family residential community to include a community center and approximately 763-acres of association-maintained open space. Vehicular access to the proposed Project will be provided via the proposed extension of Shady View Drive and Via La Cresta from its current southerly terminus into the Project site to connect to a proposed local residential network of streets.

LINSCOTT
LAW &
GREENSPAN

engineers

Engineers & Planners

Traffic
Transportation
Parking

Linscott, Law & Greenspan, Engineers

2 Executive Circle
Suite 250
Irvine, CA 92614
949.825.6175 r
949.825.5939 f
www.llgengineers.com

Pasadena
Irvine
San Diego
Woodland Hills

Philip M. Linscott, PE (1924-2000)
William A. Law, PE (1921-2018)
Jack M. Greenspan, PE (Ret.)
Paul W. Wilkinson, PE (Ret.)
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE
Walter B. Musial, PE
Kalyan C. Yellapu, PE

Per the direction of City staff, an alternative assessment assuming access from the extension of Via La Cresta will be restricted to “emergency use only” will also be evaluated in this traffic assessment. Under this access option, direct access to and from the site would be provided via Shady View Drive.

Figure 2-2 presents the proposed site plan prepared by Hunsaker and Associates.

C. Study Intersections: The following six (6) key study intersections represent a list of key study intersections. Subject to confirmation by City staff, the study intersections would include the following:

Key Intersection	Jurisdiction
1. Shady View Drive at Mystic Canyon Drive	Chino Hills
2. Shady View Drive 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

D. Level of Service and Traffic Impact Criteria: According to the City of Chino Hills guidelines, a significant traffic impact occurs when the intersections or roadway projected to operate at LOS D or better without the Project would exceed LOS D with the Project. Significant traffic impact is also considered to occur if the Project results in an increase of 0.01 or more in the volume-to-capacity (V/C) ratio at a location that is projected to operate at LOS E or F without the Project.

E. Traffic Counts: Based on current conditions, due to COVID-19 virus, the ability to collect traffic counts to establish baseline conditions is not possible. As such, to establish existing “baseline” traffic conditions, pre-COVID-19, LLG has researched historical data and was able to obtain Year 2020 pre-COVID-19 counts at two (2) of the six (6) key study locations. Given the availability of historical data, LLG proposes the following to establish pre-COVID-19 traffic conditions:

- (1) Year 2020 pre-COVID-19 data is available at the intersection of Butterfield Ranch Road/Pine Avenue (Intersection #6). Traffic counts were collected in February 2020 before state-wide “stay at home” orders went into effect. Additionally, Year 2015 historic data is available at the intersection of Shady View Drive/Butterfield Ranch Road (Intersection #2).

- (2) Given historic data is not available at the remaining four (4) study locations, LLG will collect Year 2020 COVID-19 weekday AM and PM peak period traffic counts with truck classifications at all six (6) study locations for use in establishing traffic counts/turning movement percentages.
- (3) Using information from (1) and (2), compare Year 2020 pre-COVID-19 to Year 2020 COVID-19 to establish change in traffic counts due to current COVID-19 environment for all intersections located along Butterfield Ranch Road.

It is assumed that volume along the residential roadways, such as Shady View Drive and Mystic Canyon Drive, would not experience as much of a decrease in volume due to COVID-19 when compared to main arterials such as Butterfield Ranch Road. Therefore, using information from (1) and (2), compare Year 2015 to Year 2020 COVID-19 to establish change in traffic counts due to current COVID-19 environment for the intersection of Shady View Drive/Mystic Canyon.

- (4) Apply the rates calculated in (3) to Year 2020 COVID-19 traffic counts and forecast Year 2020 traffic conditions at the missing intersections.

In support of an assessment of the potential for through traffic as well as an assessment of traffic calming measures, 24-hour roadway segment counts and speed surveys will be collected on Via La Cresta, between Twin Knolls Drive and Mystic Canyon Drive. In addition, 24-hour approach counts and pedestrian counts at the intersection of Twin Knolls Drive/Butterfield Ranch Road will also be collected in support of a traffic signal warrant assessment. Similar adjustments to what was recommended for the intersection turning movements counts will also be implemented to the 24-hr roadway counts.

F. Project Trip Generation: Trip generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation rates used in the traffic forecasting procedure are found in the 10th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2017]. **Table 1** summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and also presents the Project's forecast peak hour and daily traffic volumes. As shown in the upper portion of *Table 1*, the trip rates for ITE Land Use 210: Single-Family Detached Housing are presented.

A review of the bottom portion of *Table 1* indicates that proposed Project is forecast to generate 1,501 weekday daily trips (one half arriving, one half departing), with 118 trips (30 inbound, 88 outbound) produced during the AM

peak hour and 157 trips (99 inbound, 58 outbound) produced during the PM peak hour.

G. Project Trip Distribution: The trip distribution pattern for the proposed Project is graphically presented in *Figure 5-1*. The trip distribution pattern for the alternative Project assessment which assumes Via La Cresta will be restricted to “emergency use only” is graphically presented in *Figure 5-2*. Project traffic volumes both entering and exiting the Project site have been distributed and assigned to the adjacent street system based on the following considerations:

- location of site access points in relation to the surrounding street system,
- the site’s proximity to major traffic carriers and regional access routes,
- physical characteristics of the circulation system such as lane channelization and presence of traffic signals that affect travel patterns,
- presence of traffic congestion in the surrounding vicinity, and
- ingress/egress availability at the Project site.

H. Project Opening Year (Near-Term) Traffic:

- Project Opening Year: 2024
- Ambient Growth Rate: 2.0% per year
- Cumulative Projects: Planned and/or approved projects located within the Project site will be researched at the City of Chino Hills and adjacent jurisdictions and Community Development Departments for inclusion in the cumulative traffic analysis.

I. Long-Term Buildout Traffic: San Bernardino Traffic Analysis Model (SBTAM) will be utilized to prepare the baseline and Year 2040 link-level build-out traffic model projections/runs. The link traffic volumes will be post-processed to determine daily, AM peak hour and PM peak hour Year 2040 build-out traffic volumes without Project traffic for the six (6) study intersections.

J. Analysis Scenarios: Consistent with the City’s TIA Guidelines, the following are the proposed traffic analysis scenarios.

1. Existing Traffic Conditions,
2. Existing With Project Traffic Conditions,
3. Condition (2) with Mitigation Measures, if necessary,
4. Year 2024 Without Project Traffic Conditions,
5. Year 2024 With Project Traffic Conditions,

6. Condition (5) with Mitigation Measures, if necessary,
7. Year 2040 Without Project Traffic Conditions,
8. Year 2040 With Project Traffic Conditions, and
9. Condition (8) with Mitigation Measures, if necessary.

The LOS calculations will be based on the Highway Capacity Manual (HCM) method of analysis for signalized and unsignalized intersections. The Project's potential impacts will be based on City of Chino Hills significant impact criteria.

M. Other Issues:

- Evaluate traffic impacts at the key study intersections based on the alternative access which assumes Via La Cresta will be restricted to “emergency use only” as identified in *Figure 5-2*.
- Document transit availability and pedestrian/bicycle connectivity.
- Identify the Project's potential fair-share contribution for recommended mitigation measures, if any.
- Evaluate site access and internal circulation of the proposed Project.
- Given the location of the proposed Project to existing residential uses and proposed Project access, the Project's proposed circulation patterns and existing street conditions will be evaluated and design recommendations/mitigation will be provided in order to minimize cut-through traffic and, if necessary, “calm traffic flow” into and out of the adjacent existing neighborhood located along Via La Cresta. The assessment will include an evaluation of exiting traffic counts and speeds on Via La Cresta.
- Conduct signal warrant assessment at the intersection of Twin Knolls Drive/Butterfield Ranch Road.



We appreciate the opportunity to provide this scope of work. Should you have any questions, please call me at (949) 825-6175. Thank You.

Recommended by:

A handwritten signature in blue ink, appearing to read "R. Gackstetter", is written over a horizontal line.

Consultant's Representative

12-16-2020

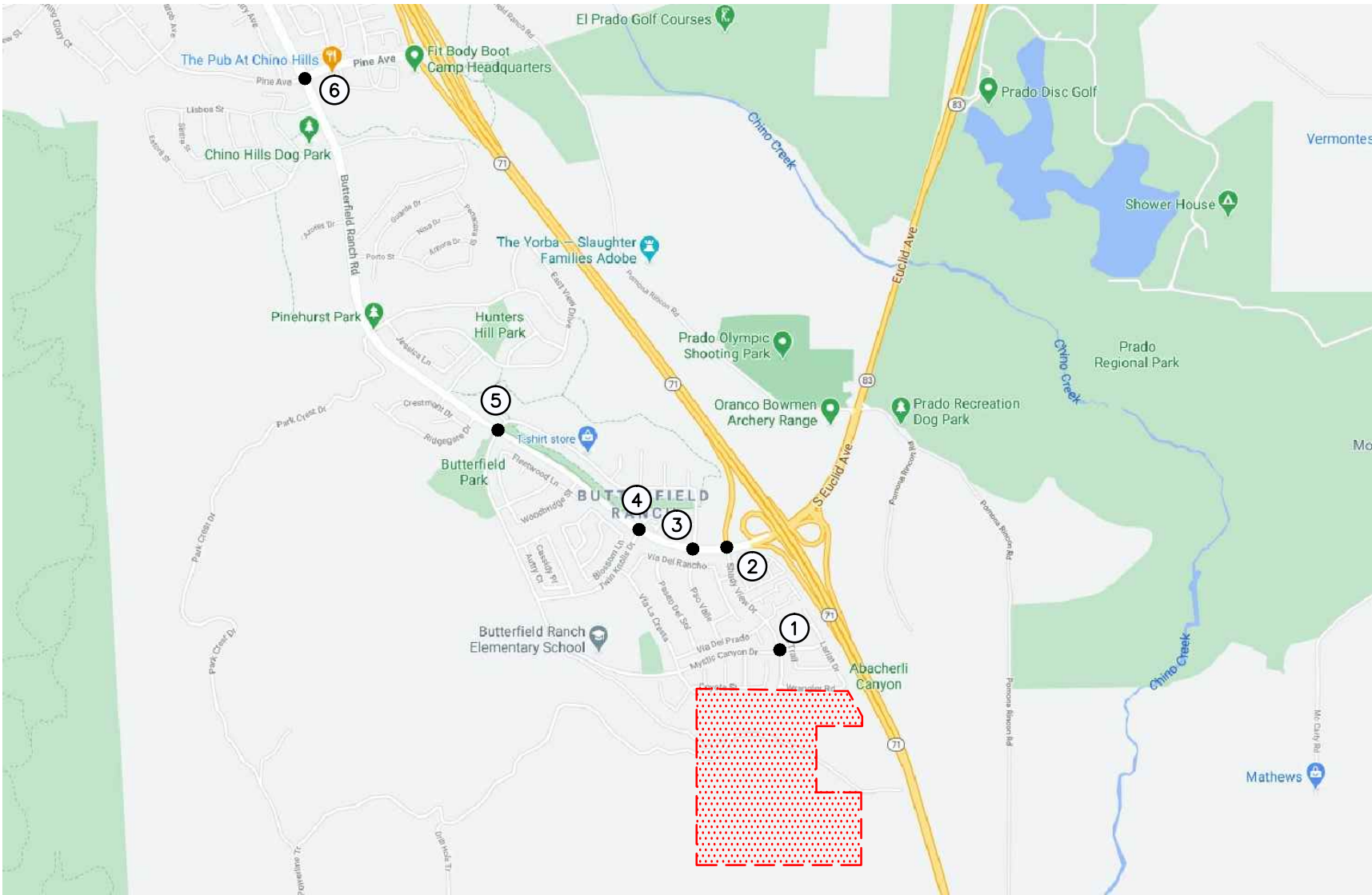
Date

Approved by:

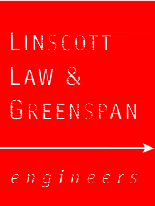
City of Chino Hills

Date

cc: File



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SOURCE: GOOGLE

KEY



-  = STUDY INTERSECTION
-  = PROJECT SITE

FIGURE 1-1

VICINITY MAP
SHADY VIEW PROJECT, CHINO HILLS



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NO SCALE

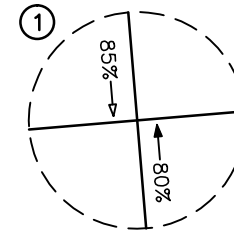
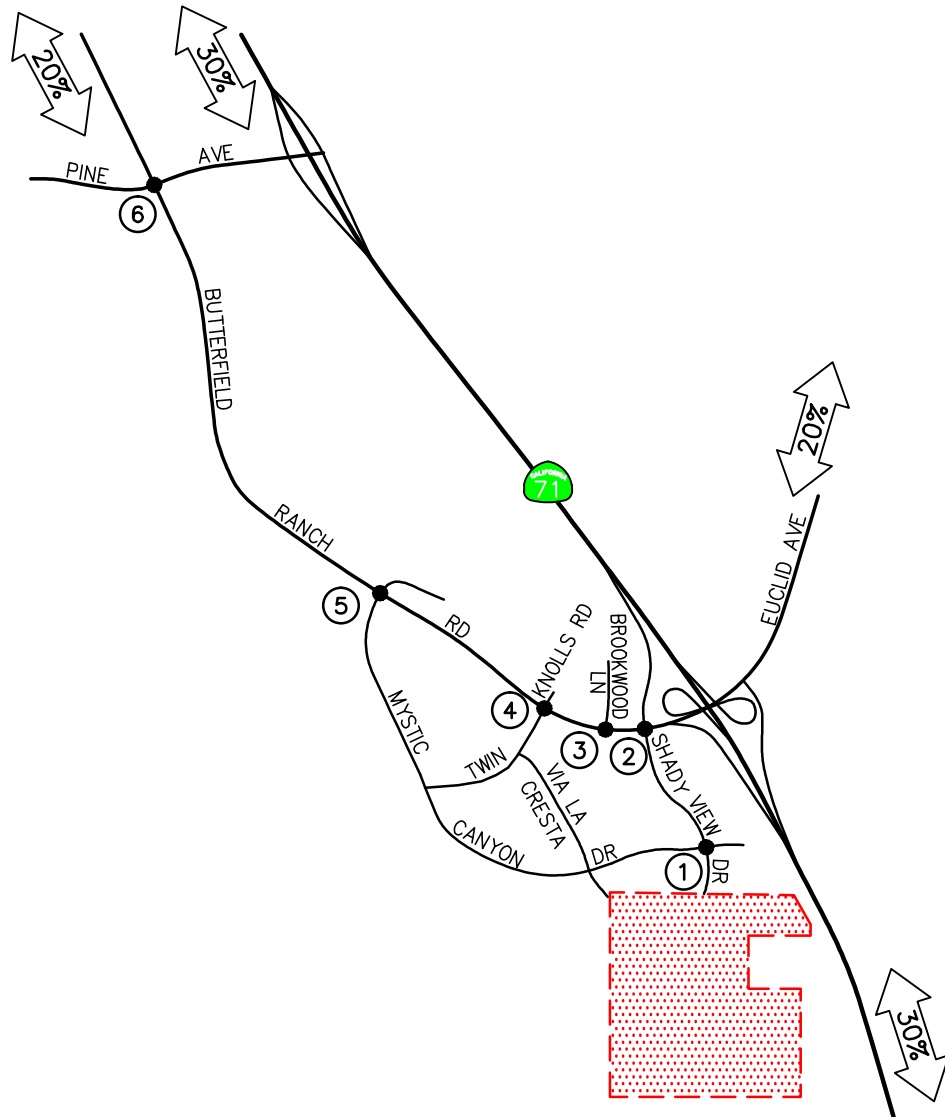
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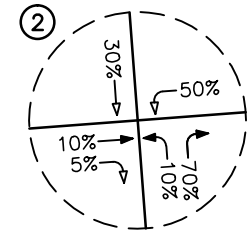
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FIGURE 2-1

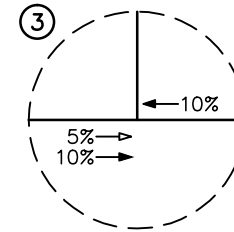
EXISTING SITE AERIAL
SHADY VIEW PROJECT, CHINO HILLS



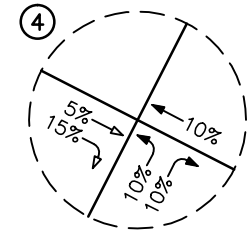
SHADY VIEW DR @
MYSTIC CANYON DR



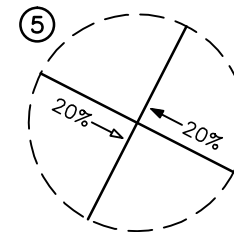
SHADY VIEW DR @
BUTTERFIELD RANCH RD



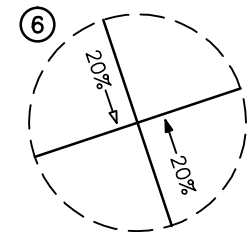
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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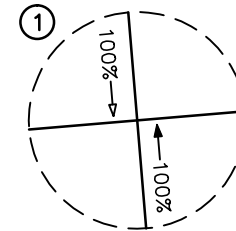
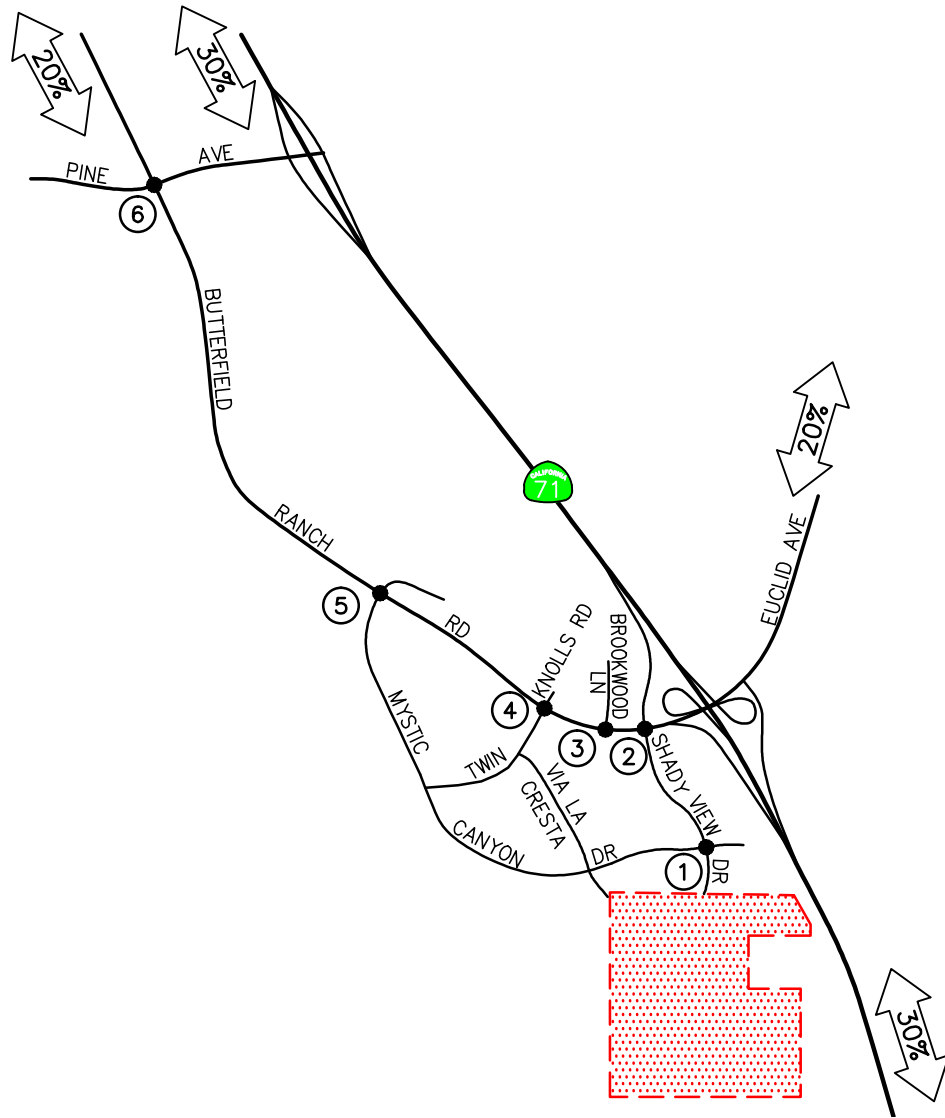


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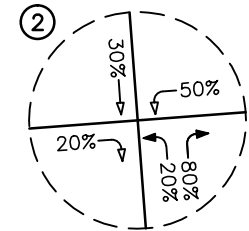
- ⊕ = STUDY INTERSECTION
- ↖ = INBOUND PERCENTAGE
- ↗ = OUTBOUND PERCENTAGE
- ▨ = PROJECT SITE

FIGURE 5-1

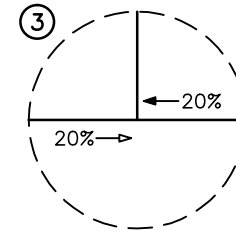
PROJECT TRIP DISTRIBUTION PATTERN
SHADY VIEW PROJECT, CHINO HILLS



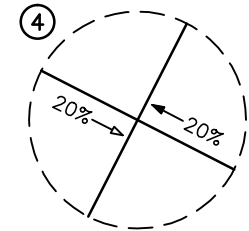
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MYSTIC CANYON DR



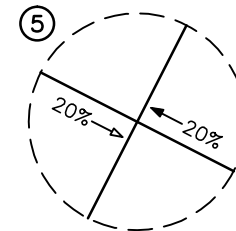
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BUTTERFIELD RANCH RD



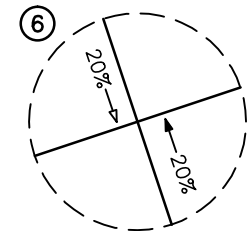
BROOKWOOD LN @
BUTTERFIELD RANCH RD



TWIN KNOLLS DR @
BUTTERFIELD RANCH RD



MYSTIC CANYON DR @
BUTTERFIELD RANCH RD



BUTTERFIELD RANCH RD @
PINE AVE

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KEY

- ⊕ = STUDY INTERSECTION
- ↔ = INBOUND PERCENTAGE
- ↔ = OUTBOUND PERCENTAGE
- ▨ = PROJECT SITE

ALTERNATIVE PROJECT TRIP DISTRIBUTION PATTERN
(VIA LA CRESTA EMERGENCY USE ONLY)

SHADY VIEW PROJECT, CHINO HILLS

FIGURE 5-2

TABLE 1
PROJECT TRIP GENERATION RATES AND FORECAST¹

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<u>Trip Generation Rates:</u>							
▪ 210: Single-Family Detached Housing (TE/DU)	9.44	25%	75%	0.74	63%	37%	0.99
<u>Project Trip Generation Forecast:</u>							
▪ Single-Family Homes (159 DU)	1,501	30	88	118	99	58	157

Notes:

- TE/DU = Trip End per Dwelling Unit

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

APPENDIX B
EXISTING TRAFFIC COUNT DATA

APPENDIX B-1

VOLUME DEVELOPMENT TABLES

**Table B-1
Year 2021 Pre-COVID-19 Baseline Volume Development**

Study Intersection	(1) 2020 AM Intersection Volume (Pre- COVID-19)	(2) 2020 PM Intersection Volume (Pre- COVID-19)	(3) 2020 COVID- 19 AM Volume	(4) 2020 COVID- 19 PM Volume	(5) 2020 COVID- 19 AM Growth Per Year (%) [3]	(6) 2020 COVID- 19 PM Growth Per Year (%) [4]	(7) 2020 Adjusted AM Intersection Volume [5]	(8) 2020 Adjusted PM Intersection Volume [6]	(9) Final 2020 Baseline AM Intersection Volume	(10) Final 2020 Baseline PM Intersection Volume	(11) 2021 Baseline AM Intersection Volume by applying 2% per year to Column 9	(12) 2021 Baseline PM Intersection Volume by applying 2% per year to Column 10
1. Shady View Drive at Mystic Canyon Drive [1]	--	--	--	--	--	--	--	--	--	--	--	--
2. Shady View Drive at Butterfield Ranch Road [2]	--	--	--	--	--	--	--	--	--	--	--	--
3. Brookwood Lane at Butterfield Ranch Road	--	--	443	641	--	--	1,063	1,219	1,063	1,219	1,084	1,243
4. Twin Knolls Drive at Butterfield Ranch Road	--	--	351	585	--	--	842	1,112	842	1,112	859	1,134
5. Mystic Canyon Drive at Butterfield Ranch Road	--	--	288	619	--	--	691	1,177	691	1,177	705	1,201
6. Butterfield Ranch Road at Pine Avenue	1,493	2,177	622	1,145	-140.0%	-90.1%	--	--	1,493	2,177	1,523	2,221
Average Growth Rate Per Year					-140.0%	-90.1%						

Notes:

- [1] Refer to *Table B-2* for volume development at Shady View Drive/Mystic Canyon Drive (Intersection No. 1).
- [2] Shady View Drive/Butterfield Ranch Road (Intersection No. 2) volumes were developed by applying 2% growth rate per year to the historic 2015 counts.
- [3] (Column 3 - Column 1) / Column 3
- [4] (Column 4 - Column 2) / Column 4
- [5] 2020 Adjusted Volumes were developed by applying the average growth rate per year calculated in Column 5.
Column 3 + (Column 3 × 140.0%)
- [6] 2020 Adjusted Volumes were developed by applying the average growth rate per year calculated in Column 6.
Column 4 + (Column 4 × 90.1%)

Table B-2
Year 2021 Pre-COVID-19 Baseline Volume Development - Residential Roadways [1]

Study Intersection	(1) 2015 AM Intersection Volume	(2) 2015 PM Intersection Volume	(3) 2020 COVID- 19 AM Volume	(4) 2020 COVID- 19 PM Volume	(5) 2020 COVID- 19 AM Growth Per Year (%) [3]	(6) 2020 COVID- 19 PM Growth Per Year (%) [4]	(7) Final 2020 Adjusted Baseline AM Intersection Volume [5]	(8) Final 2020 Adjusted Baseline PM Intersection Volume [6]	(9) AM Intersection Volume by applying 2% per year to Column 9	(10) Intersection Volume by applying 2% per year to Column 10
1. Shady View Drive at Mystic Canyon Drive	--	--	139	144	--	--	275	207	281	211
2. Shady View Drive at Butterfield Ranch Road [2]	503	415	254	288	-19.6%	-8.8%	--	--	--	--
3. Brookwood Lane at Butterfield Ranch Road	--	--	--	--	--	--	--	--	--	--
4. Twin Knolls Drive at Butterfield Ranch Road	--	--	--	--	--	--	--	--	--	--
5. Mystic Canyon Drive at Butterfield Ranch Road	--	--	--	--	--	--	--	--	--	--
6. Butterfield Ranch Road at Pine Avenue	--	--	--	--	--	--	--	--	--	--
Average Growth Rate Per Year					-19.6%	-8.8%				

Notes:

- [1] It is assumed that volume along the residential roadways, such as Shady View Drive/Mystic Canyon Drive (Intersection No. 1), would not experience as much of a decrease in volume due to COVID-19 when compared to main arterials such as Butterfield Ranch Road. Therefore, Year 2015 historic data traveling to/from Shady View Drive at Shady View Drive/Butterfield Ranch Road (Intersection No. 2) has been used to establish a change in traffic counts for Shady View Drive/Mystic Canyon Drive (Intersection No. 1).
- [2] Intersection volumes reported for Shady View Drive/Butterfield Ranch Road only include those traveling to and from Shady View Drive.
- [3] $[(\text{Column 3} - \text{Column 1}) / \text{Column 3}] / (2020 - 2015)$
- [4] $[(\text{Column 4} - \text{Column 2}) / \text{Column 4}] / (2020 - 2015)$
- [5] 2020 Adjusted Baseline Volumes were developed by applying the average growth rate per year calculated in Column 5.
 $\text{Column 3} + [\text{Column 3} \times (19.6\% \times (2020 - 2015))]$
- [6] 2020 Adjusted Baseline Volumes were developed by applying the average growth rate per year calculated in Column 6.
 $\text{Column 4} + [\text{Column 4} \times (8.8\% \times (2020 - 2015))]$

APPENDIX B-II

INTERSECTION COUNTS

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

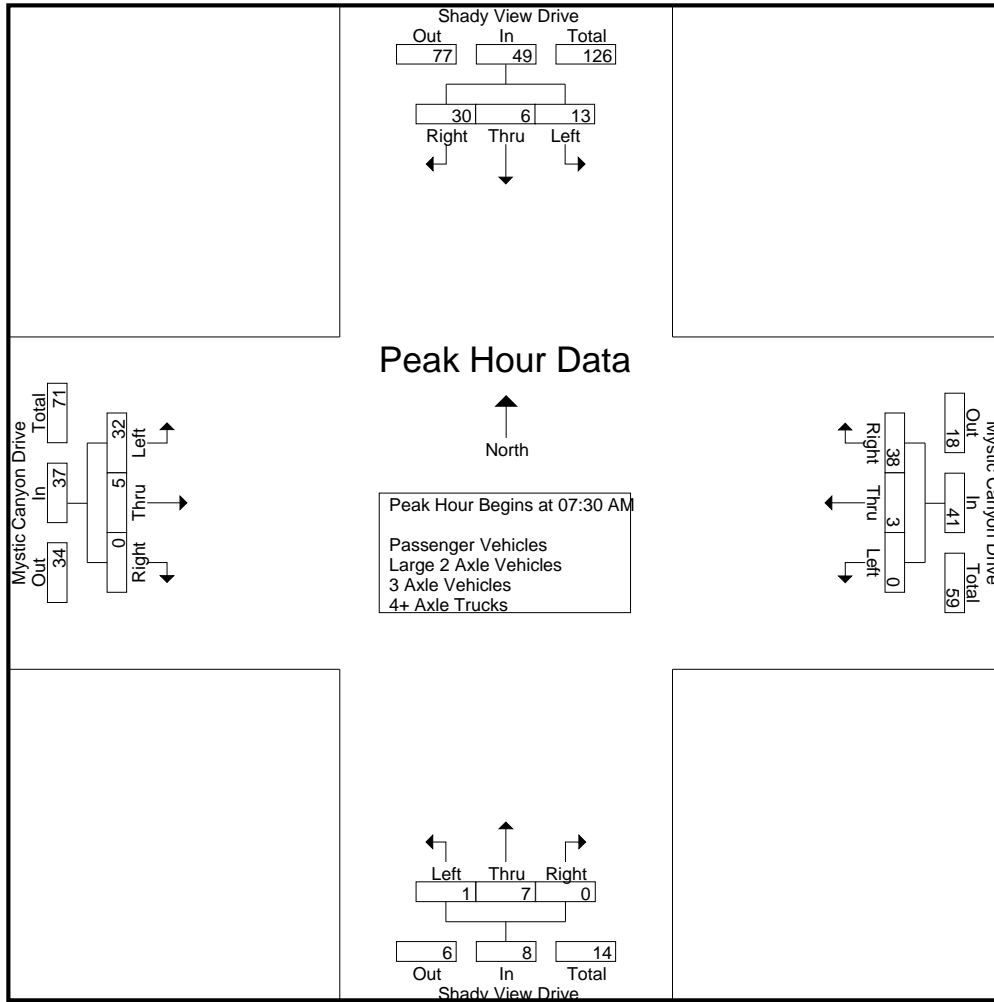
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	3	0	1	4	0	2	4	6	0	2	0	2	4	0	0	4	16
07:15 AM	2	1	5	8	0	0	11	11	0	1	0	1	9	0	0	9	29
07:30 AM	1	3	7	11	0	0	11	11	1	2	0	3	6	1	0	7	32
07:45 AM	4	0	10	14	0	0	9	9	0	0	0	0	10	0	0	10	33
Total	10	4	23	37	0	2	35	37	1	5	0	6	29	1	0	30	110
08:00 AM	3	1	7	11	0	1	9	10	0	1	0	1	4	1	0	5	27
08:15 AM	5	2	6	13	0	2	9	11	0	4	0	4	12	3	0	15	43
08:30 AM	3	1	3	7	0	0	7	7	0	2	0	2	8	1	0	9	25
08:45 AM	2	3	6	11	0	2	10	12	0	1	0	1	7	2	0	9	33
Total	13	7	22	42	0	5	35	40	0	8	0	8	31	7	0	38	128
Grand Total	23	11	45	79	0	7	70	77	1	13	0	14	60	8	0	68	238
Apprch %	29.1	13.9	57		0	9.1	90.9		7.1	92.9	0		88.2	11.8	0		
Total %	9.7	4.6	18.9	33.2	0	2.9	29.4	32.4	0.4	5.5	0	5.9	25.2	3.4	0	28.6	
Passenger Vehicles	23	10	37	70	0	7	69	76	1	13	0	14	59	8	0	67	227
% Passenger Vehicles	100	90.9	82.2	88.6	0	100	98.6	98.7	100	100	0	100	98.3	100	0	98.5	95.4
Large 2 Axle Vehicles	0	0	8	8	0	0	1	1	0	0	0	0	1	0	0	1	10
% Large 2 Axle Vehicles	0	0	17.8	10.1	0	0	1.4	1.3	0	0	0	0	1.7	0	0	1.5	4.2
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% 4+ Axle Trucks	0	9.1	0	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0.4

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	3	7	11	0	0	11	11	1	2	0	3	6	1	0	7	32
07:45 AM	4	0	10	14	0	0	9	9	0	0	0	0	10	0	0	10	33
08:00 AM	3	1	7	11	0	1	9	10	0	1	0	1	4	1	0	5	27
08:15 AM	5	2	6	13	0	2	9	11	0	4	0	4	12	3	0	15	43
Total Volume	13	6	30	49	0	3	38	41	1	7	0	8	32	5	0	37	135
% App. Total	26.5	12.2	61.2		0	7.3	92.7		12.5	87.5	0		86.5	13.5	0		
PHF	.650	.500	.750	.875	.000	.375	.864	.932	.250	.438	.000	.500	.667	.417	.000	.617	.785

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:30 AM				07:45 AM			
+0 mins.	1	3	7	11	0	0	11	11	1	2	0	3	10	0	0	10
+15 mins.	4	0	10	14	0	0	11	11	0	0	0	0	4	1	0	5
+30 mins.	3	1	7	11	0	0	9	9	0	1	0	1	12	3	0	15
+45 mins.	5	2	6	13	0	1	9	10	0	4	0	4	8	1	0	9
Total Volume	13	6	30	49	0	1	40	41	1	7	0	8	34	5	0	39
% App. Total	26.5	12.2	61.2		0	2.4	97.6		12.5	87.5	0		87.2	12.8	0	
PHF	.650	.500	.750	.875	.000	.250	.909	.932	.250	.438	.000	.500	.708	.417	.000	.650

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

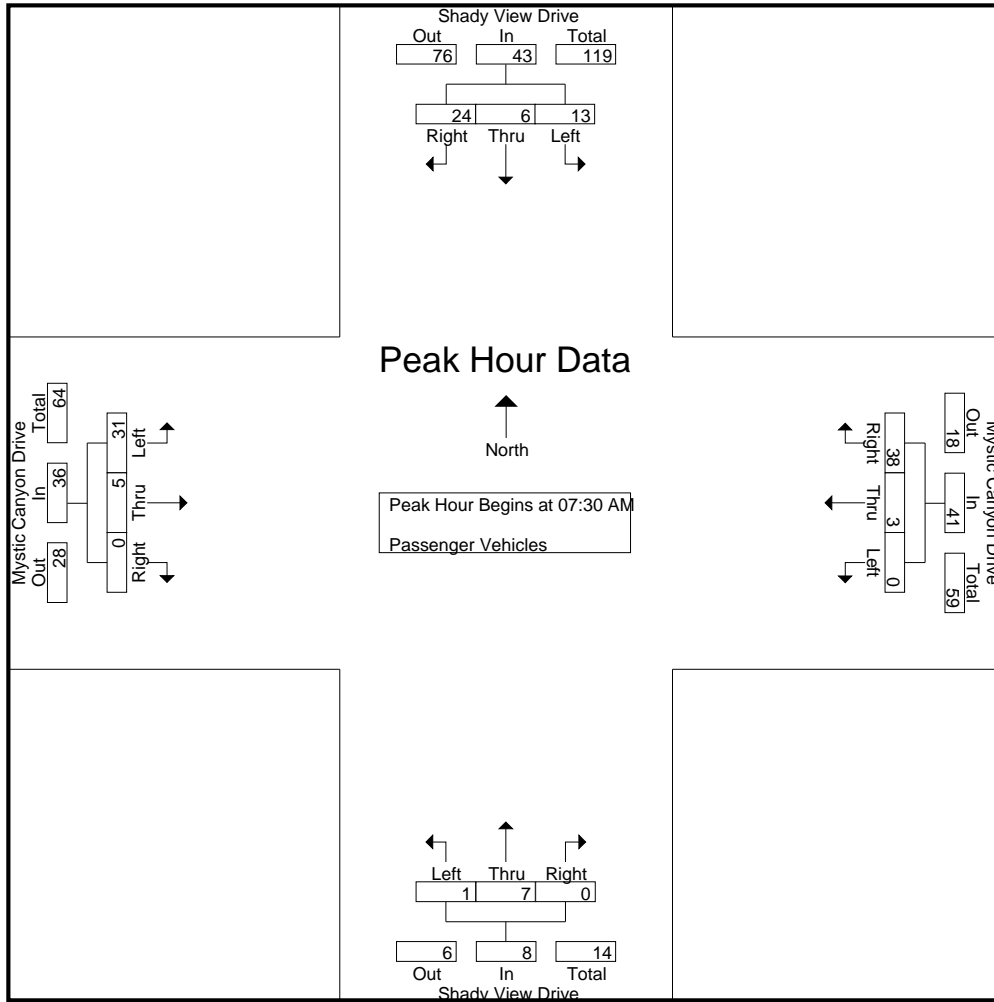
Groups Printed- Passenger Vehicles

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	3	0	1	4	0	2	4	6	0	2	0	2	4	0	0	4	16
07:15 AM	2	0	4	6	0	0	10	10	0	1	0	1	9	0	0	9	26
07:30 AM	1	3	5	9	0	0	11	11	1	2	0	3	6	1	0	7	30
07:45 AM	4	0	8	12	0	0	9	9	0	0	0	0	10	0	0	10	31
Total	10	3	18	31	0	2	34	36	1	5	0	6	29	1	0	30	103
08:00 AM	3	1	5	9	0	1	9	10	0	1	0	1	3	1	0	4	24
08:15 AM	5	2	6	13	0	2	9	11	0	4	0	4	12	3	0	15	43
08:30 AM	3	1	3	7	0	0	7	7	0	2	0	2	8	1	0	9	25
08:45 AM	2	3	5	10	0	2	10	12	0	1	0	1	7	2	0	9	32
Total	13	7	19	39	0	5	35	40	0	8	0	8	30	7	0	37	124
Grand Total	23	10	37	70	0	7	69	76	1	13	0	14	59	8	0	67	227
Apprch %	32.9	14.3	52.9		0	9.2	90.8		7.1	92.9	0		88.1	11.9	0		
Total %	10.1	4.4	16.3	30.8	0	3.1	30.4	33.5	0.4	5.7	0	6.2	26	3.5	0	29.5	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	3	5	9	0	0	11	11	1	2	0	3	6	1	0	7	30
07:45 AM	4	0	8	12	0	0	9	9	0	0	0	0	10	0	0	10	31
08:00 AM	3	1	5	9	0	1	9	10	0	1	0	1	3	1	0	4	24
08:15 AM	5	2	6	13	0	2	9	11	0	4	0	4	12	3	0	15	43
Total Volume	13	6	24	43	0	3	38	41	1	7	0	8	31	5	0	36	128
% App. Total	30.2	14	55.8		0	7.3	92.7		12.5	87.5	0		86.1	13.9	0		
PHF	.650	.500	.750	.827	.000	.375	.864	.932	.250	.438	.000	.500	.646	.417	.000	.600	.744

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	1	3	5	9	0	0	11	11	1	2	0	3	6	1	0	7
+15 mins.	4	0	8	12	0	0	9	9	0	0	0	0	10	0	0	10
+30 mins.	3	1	5	9	0	1	9	10	0	1	0	1	3	1	0	4
+45 mins.	5	2	6	13	0	2	9	11	0	4	0	4	12	3	0	15
Total Volume	13	6	24	43	0	3	38	41	1	7	0	8	31	5	0	36
% App. Total	30.2	14	55.8		0	7.3	92.7		12.5	87.5	0		86.1	13.9	0	
PHF	.650	.500	.750	.827	.000	.375	.864	.932	.250	.438	.000	.500	.646	.417	.000	.600

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

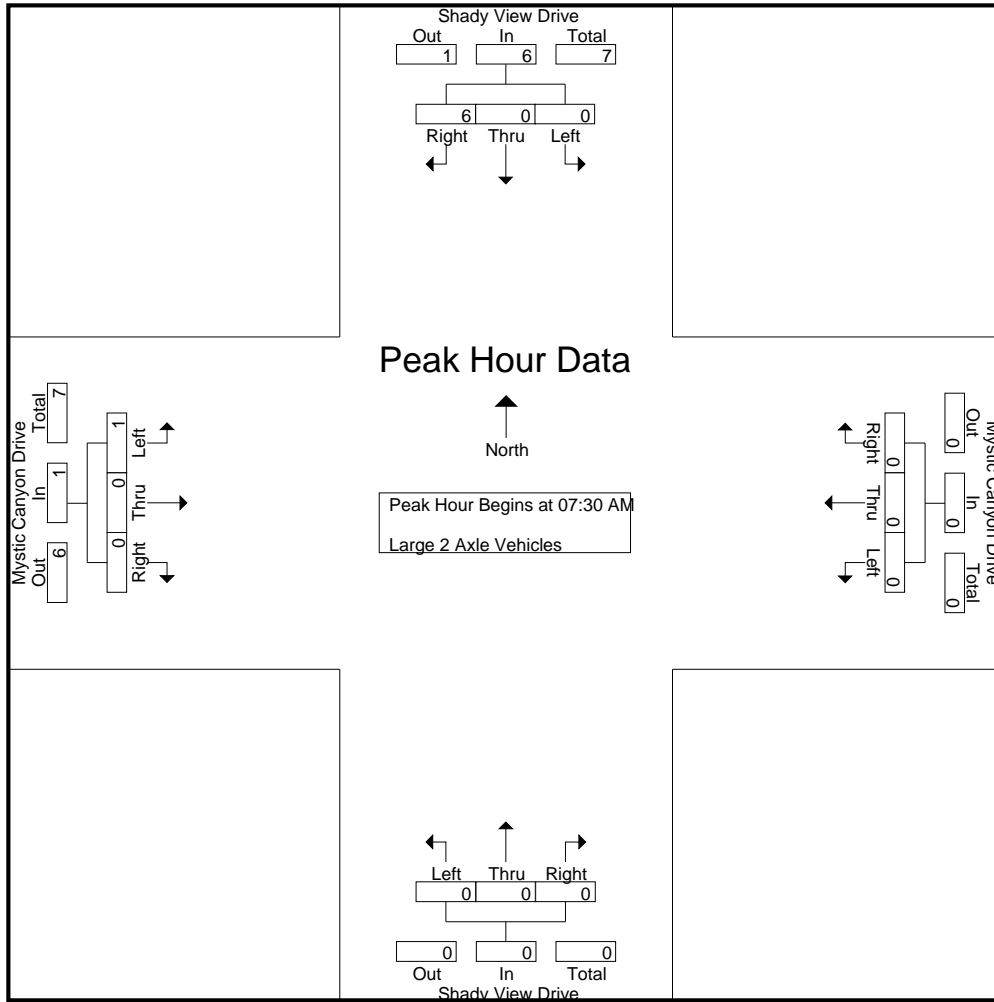
Groups Printed- Large 2 Axle Vehicles

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	5	5	0	0	1	1	0	0	0	0	0	0	0	0	0	6
08:00 AM	0	0	2	2	0	0	0	0	0	0	0	0	1	0	0	1	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	3	3	0	0	0	0	0	0	0	0	1	0	0	1	0	4
Grand Total	0	0	8	8	0	0	1	1	0	0	0	0	1	0	0	1	0	10
Apprch %	0	0	100		0	0	100		0	0	0		100	0	0			
Total %	0	0	80	80	0	0	10	10	0	0	0	0	10	0	0	10		

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:30 AM																		
07:30 AM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:00 AM	0	0	2	2	0	0	0	0	0	0	0	0	1	0	0	1	0	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	6	6	0	0	0	0	0	0	0	0	1	0	0	1	0	7
% App. Total	0	0	100		0	0	0		0	0	0		100	0	0			
PHF	.000	.000	.750	.750	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250		.583

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	2	2	0	0	0	0	0	0	0	0	1	0	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	6	6	0	0	0	0	0	0	0	0	1	0	0	1
% App. Total	0	0	100		0	0	0		0	0	0		100	0	0	
PHF	.000	.000	.750	.750	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

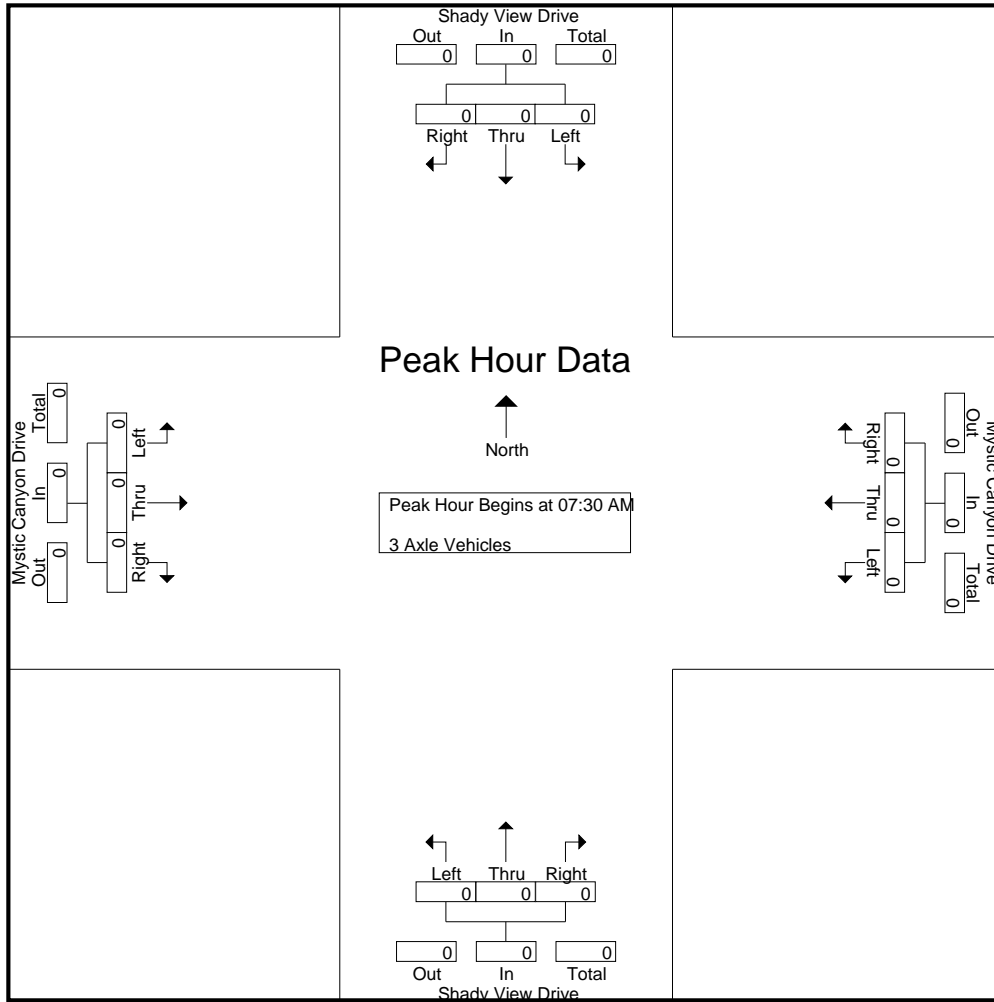
Groups Printed- 3 Axle Vehicles

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
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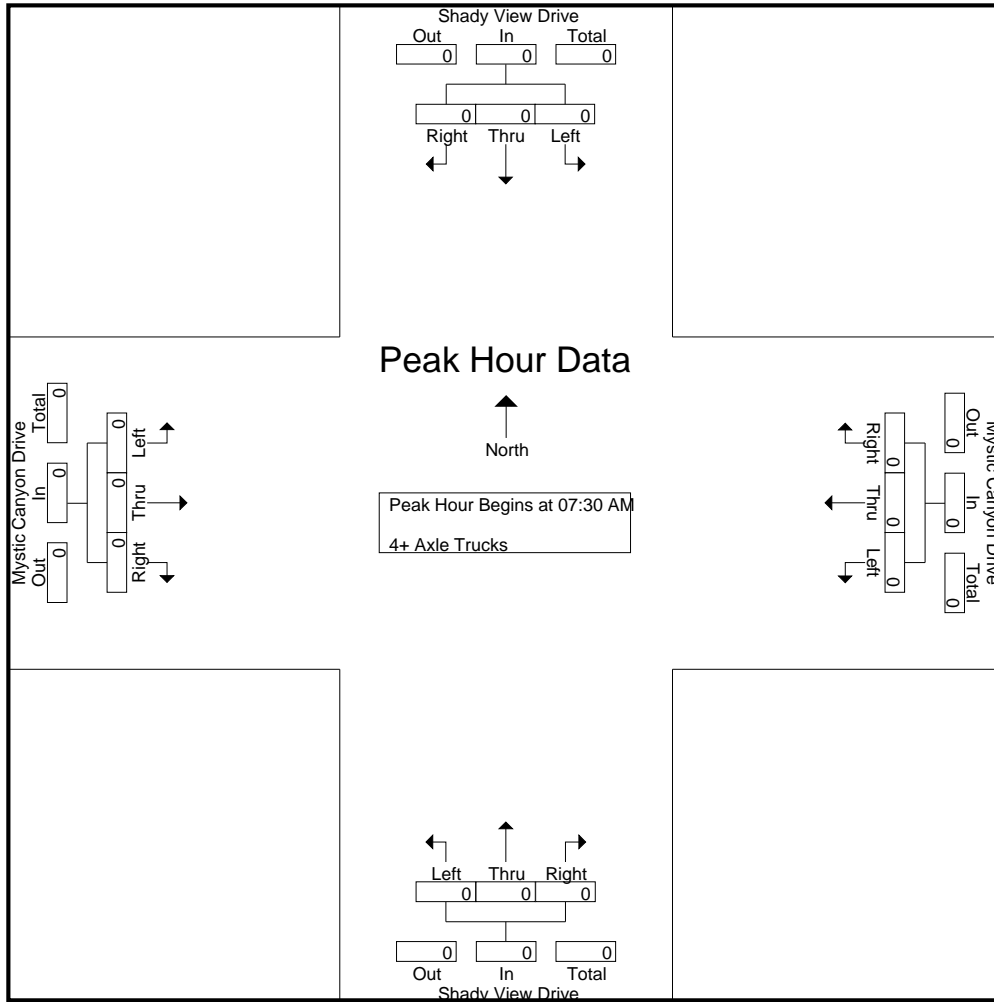
Groups Printed- 4+ Axle Trucks

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0		
Total %	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

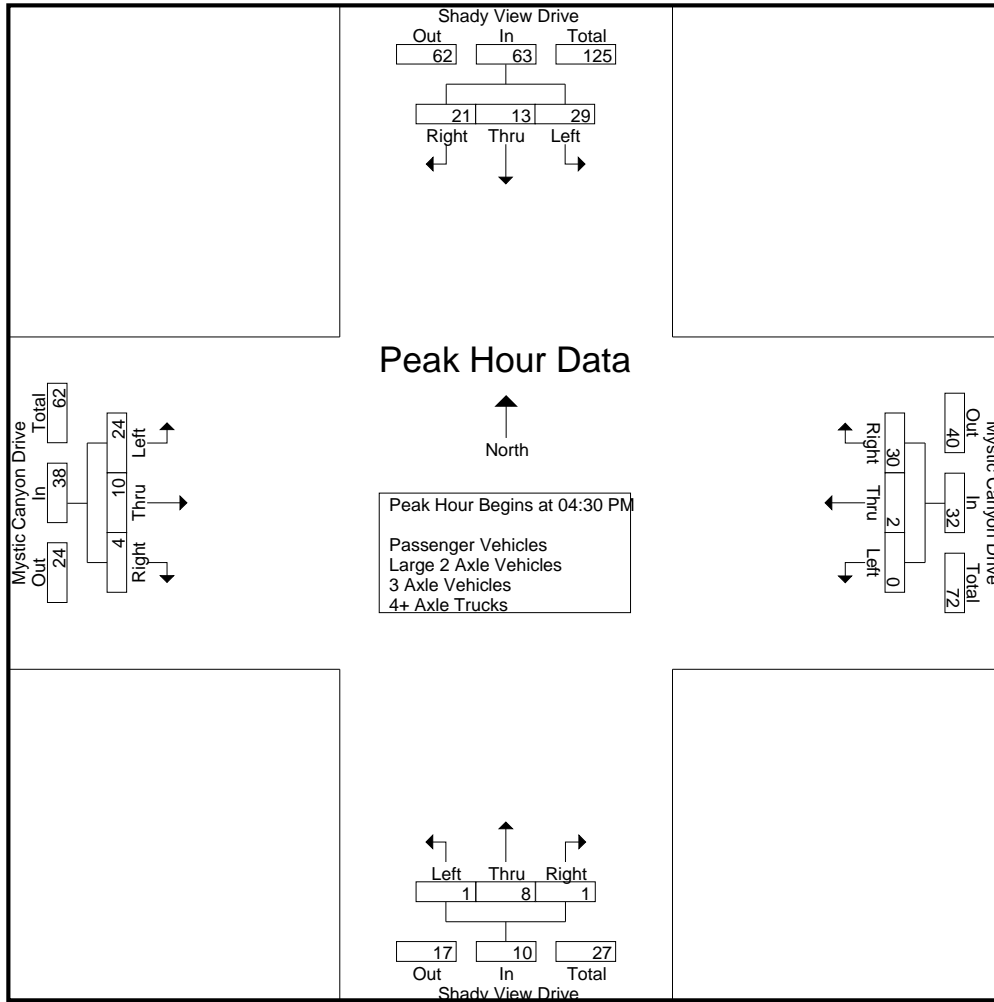
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	10	2	3	15	0	1	6	7	1	2	0	3	5	0	1	6	31
04:15 PM	5	1	8	14	0	0	2	2	0	4	0	4	4	0	0	4	24
04:30 PM	8	4	7	19	0	1	12	13	1	3	1	5	8	1	1	10	47
04:45 PM	6	1	4	11	0	0	10	10	0	1	0	1	5	3	0	8	30
Total	29	8	22	59	0	2	30	32	2	10	1	13	22	4	2	28	132
05:00 PM	5	1	5	11	0	1	4	5	0	1	0	1	7	1	2	10	27
05:15 PM	10	7	5	22	0	0	4	4	0	3	0	3	4	5	1	10	39
05:30 PM	8	2	8	18	0	0	3	3	0	2	0	2	7	2	0	9	32
05:45 PM	9	3	9	21	0	0	5	5	0	2	0	2	5	3	0	8	36
Total	32	13	27	72	0	1	16	17	0	8	0	8	23	11	3	37	134
Grand Total	61	21	49	131	0	3	46	49	2	18	1	21	45	15	5	65	266
Apprch %	46.6	16	37.4		0	6.1	93.9		9.5	85.7	4.8		69.2	23.1	7.7		
Total %	22.9	7.9	18.4	49.2	0	1.1	17.3	18.4	0.8	6.8	0.4	7.9	16.9	5.6	1.9	24.4	
Passenger Vehicles	58	21	48	127	0	3	45	48	1	18	1	20	44	15	5	64	259
% Passenger Vehicles	95.1	100	98	96.9	0	100	97.8	98	50	100	100	95.2	97.8	100	100	98.5	97.4
Large 2 Axle Vehicles	3	0	1	4	0	0	1	1	1	0	0	1	1	0	0	1	7
% Large 2 Axle Vehicles	4.9	0	2	3.1	0	0	2.2	2	50	0	0	4.8	2.2	0	0	1.5	2.6
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	8	4	7	19	0	1	12	13	1	3	1	5	8	1	1	10	47
04:45 PM	6	1	4	11	0	0	10	10	0	1	0	1	5	3	0	8	30
05:00 PM	5	1	5	11	0	1	4	5	0	1	0	1	7	1	2	10	27
05:15 PM	10	7	5	22	0	0	4	4	0	3	0	3	4	5	1	10	39
Total Volume	29	13	21	63	0	2	30	32	1	8	1	10	24	10	4	38	143
% App. Total	46	20.6	33.3		0	6.2	93.8		10	80	10		63.2	26.3	10.5		
PHF	.725	.464	.750	.716	.000	.500	.625	.615	.250	.667	.250	.500	.750	.500	.500	.950	.761

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	5	1	5	11	0	1	6	7	1	2	0	3	8	1	1	10
+15 mins.	10	7	5	22	0	0	2	2	0	4	0	4	5	3	0	8
+30 mins.	8	2	8	18	0	1	12	13	1	3	1	5	7	1	2	10
+45 mins.	9	3	9	21	0	0	10	10	0	1	0	1	4	5	1	10
Total Volume	32	13	27	72	0	2	30	32	2	10	1	13	24	10	4	38
% App. Total	44.4	18.1	37.5		0	6.2	93.8		15.4	76.9	7.7		63.2	26.3	10.5	
PHF	.800	.464	.750	.818	.000	.500	.625	.615	.500	.625	.250	.650	.750	.500	.500	.950

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

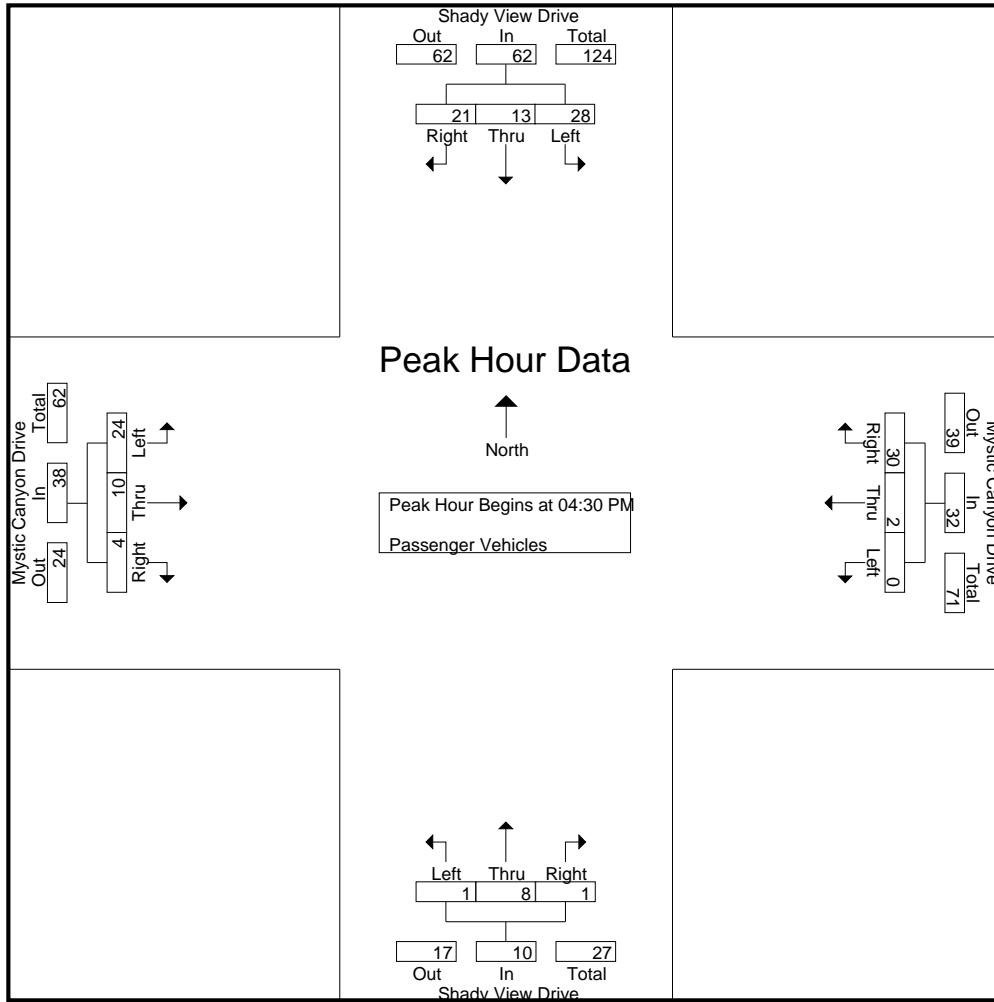
Groups Printed- Passenger Vehicles

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	9	2	3	14	0	1	6	7	0	2	0	2	5	0	1	6	29
04:15 PM	5	1	7	13	0	0	2	2	0	4	0	4	3	0	0	3	22
04:30 PM	8	4	7	19	0	1	12	13	1	3	1	5	8	1	1	10	47
04:45 PM	6	1	4	11	0	0	10	10	0	1	0	1	5	3	0	8	30
Total	28	8	21	57	0	2	30	32	1	10	1	12	21	4	2	27	128
05:00 PM	5	1	5	11	0	1	4	5	0	1	0	1	7	1	2	10	27
05:15 PM	9	7	5	21	0	0	4	4	0	3	0	3	4	5	1	10	38
05:30 PM	7	2	8	17	0	0	2	2	0	2	0	2	7	2	0	9	30
05:45 PM	9	3	9	21	0	0	5	5	0	2	0	2	5	3	0	8	36
Total	30	13	27	70	0	1	15	16	0	8	0	8	23	11	3	37	131
Grand Total	58	21	48	127	0	3	45	48	1	18	1	20	44	15	5	64	259
Apprch %	45.7	16.5	37.8		0	6.2	93.8		5	90	5		68.8	23.4	7.8		
Total %	22.4	8.1	18.5	49	0	1.2	17.4	18.5	0.4	6.9	0.4	7.7	17	5.8	1.9	24.7	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	8	4	7	19	0	1	12	13	1	3	1	5	8	1	1	10	47
04:45 PM	6	1	4	11	0	0	10	10	0	1	0	1	5	3	0	8	30
05:00 PM	5	1	5	11	0	1	4	5	0	1	0	1	7	1	2	10	27
05:15 PM	9	7	5	21	0	0	4	4	0	3	0	3	4	5	1	10	38
Total Volume	28	13	21	62	0	2	30	32	1	8	1	10	24	10	4	38	142
% App. Total	45.2	21	33.9		0	6.2	93.8		10	80	10		63.2	26.3	10.5		
PHF	.778	.464	.750	.738	.000	.500	.625	.615	.250	.667	.250	.500	.750	.500	.500	.950	.755

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	8	4	7	19	0	1	12	13	1	3	1	5	8	1	1	10
+15 mins.	6	1	4	11	0	0	10	10	0	1	0	1	5	3	0	8
+30 mins.	5	1	5	11	0	1	4	5	0	1	0	1	7	1	2	10
+45 mins.	9	7	5	21	0	0	4	4	0	3	0	3	4	5	1	10
Total Volume	28	13	21	62	0	2	30	32	1	8	1	10	24	10	4	38
% App. Total	45.2	21	33.9		0	6.2	93.8		10	80	10		63.2	26.3	10.5	
PHF	.778	.464	.750	.738	.000	.500	.625	.615	.250	.667	.250	.500	.750	.500	.500	.950

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

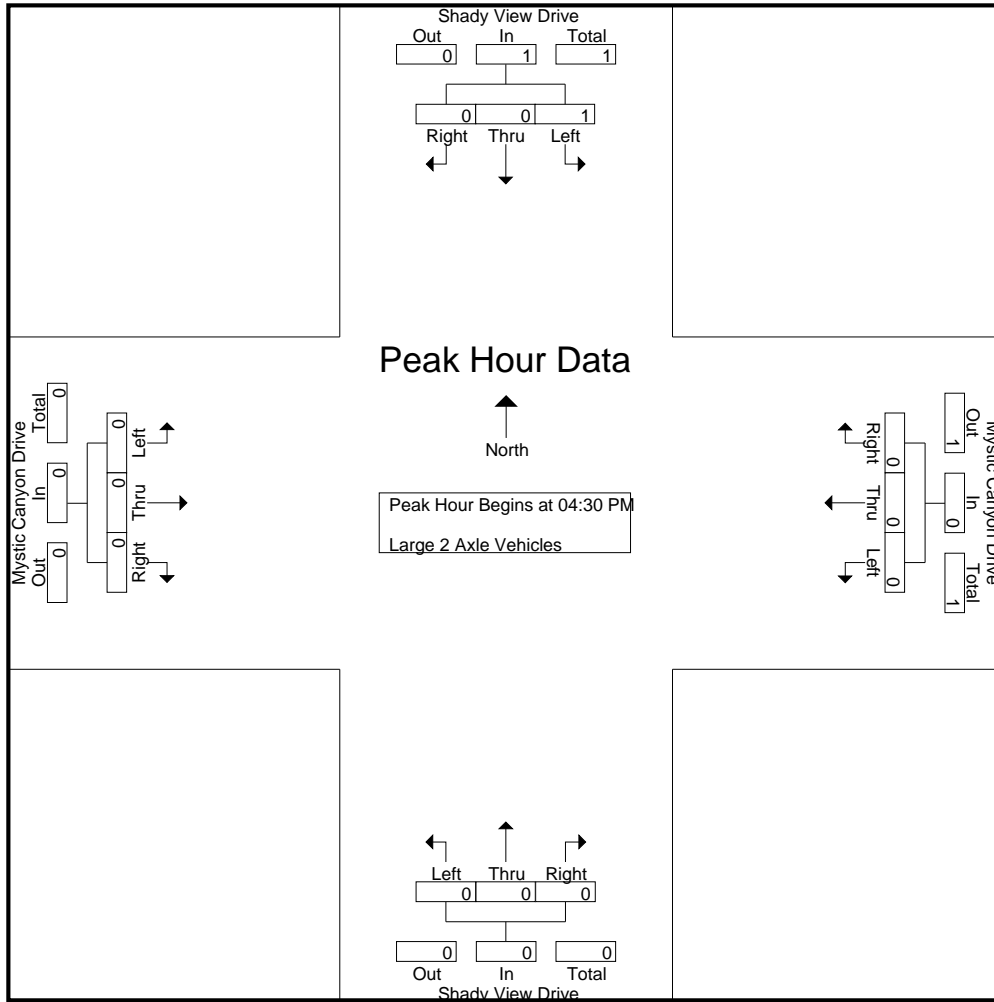
Groups Printed- Large 2 Axle Vehicles

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	2
04:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	2
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	1	2	0	0	0	0	1	0	0	1	1	0	0	1	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	1	1	0	0	0	0	0	0	0	0	3
Grand Total	3	0	1	4	0	0	1	1	1	0	0	1	1	0	0	1	7
Apprch %	75	0	25		0	0	100		100	0	0		100	0	0		
Total %	42.9	0	14.3	57.1	0	0	14.3	14.3	14.3	0	0	14.3	14.3	0	0	14.3	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

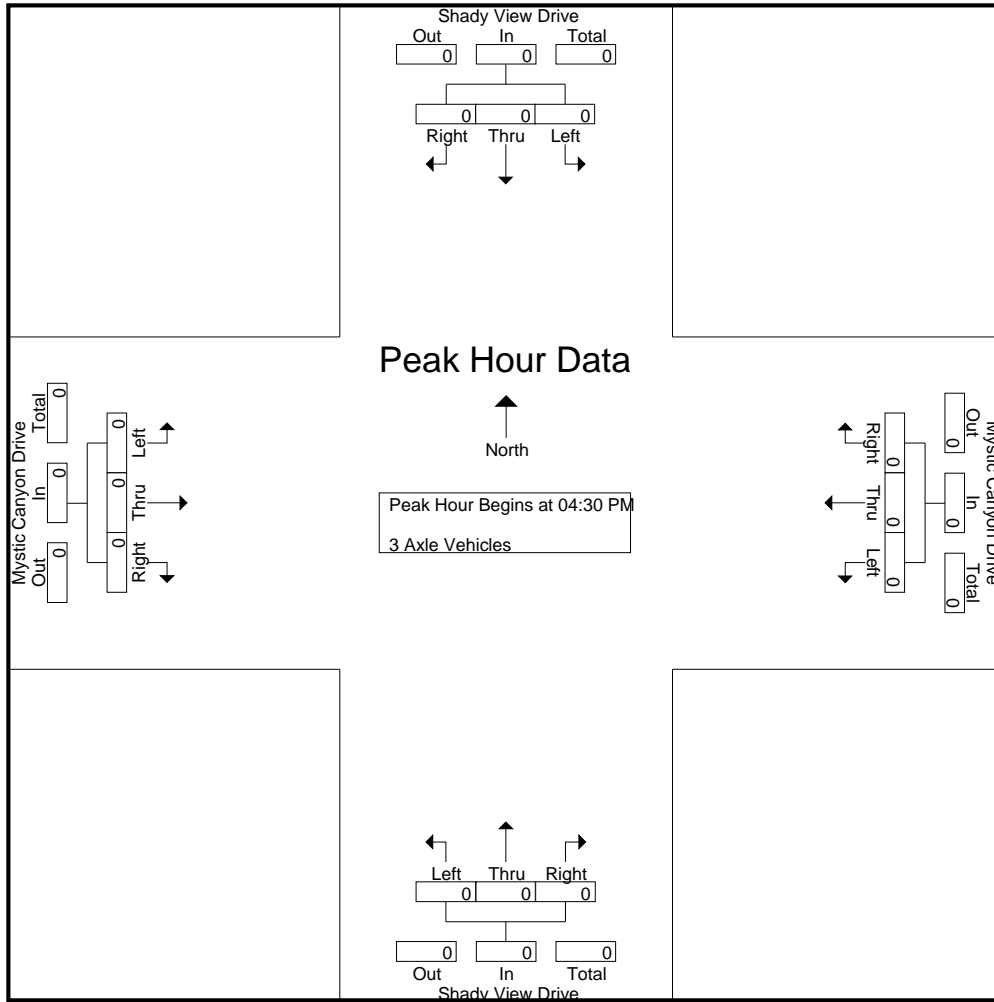
Groups Printed- 3 Axle Vehicles

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

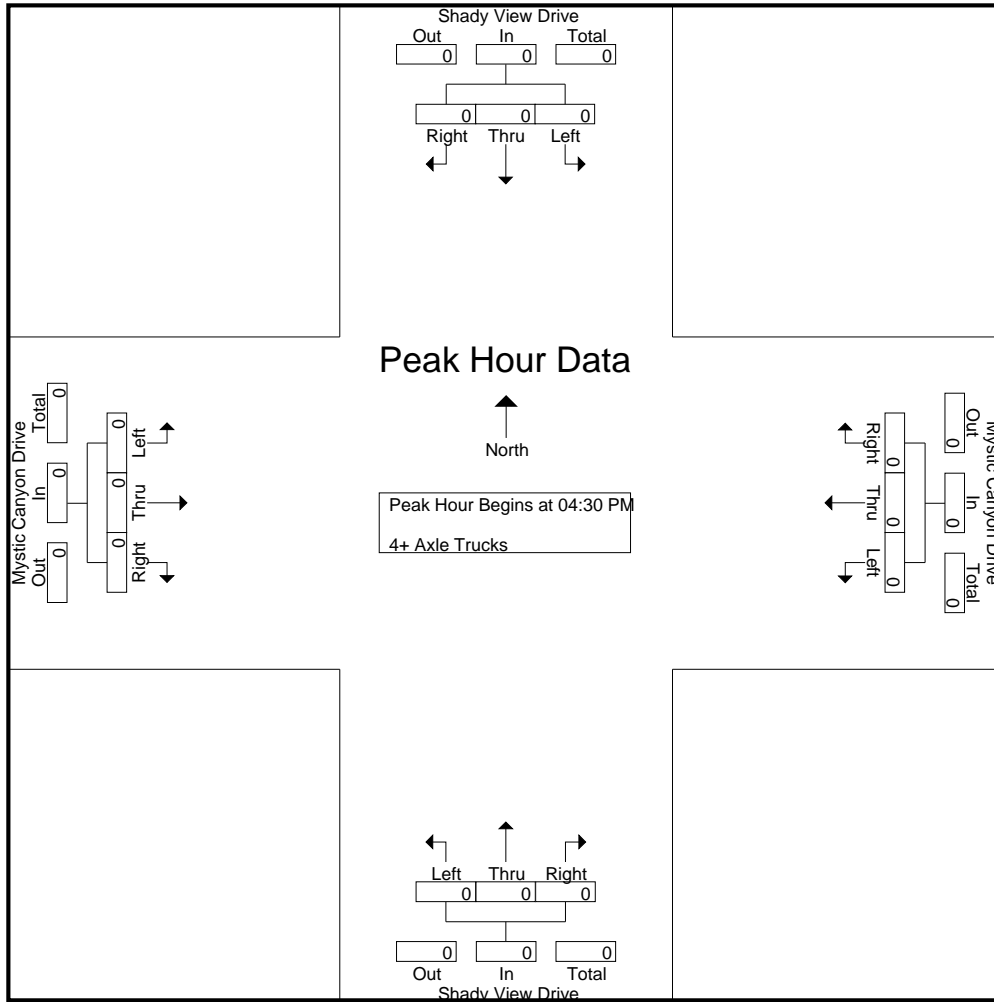
Groups Printed- 4+ Axle Trucks

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Shady View Drive Southbound				Mystic Canyon Drive Westbound				Shady View Drive Northbound				Mystic Canyon Drive Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Shady View Drive
 E/W: Mystic Canyon Drive
 Weather: Clear

File Name : 01_CHH_Shady_Mystic PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

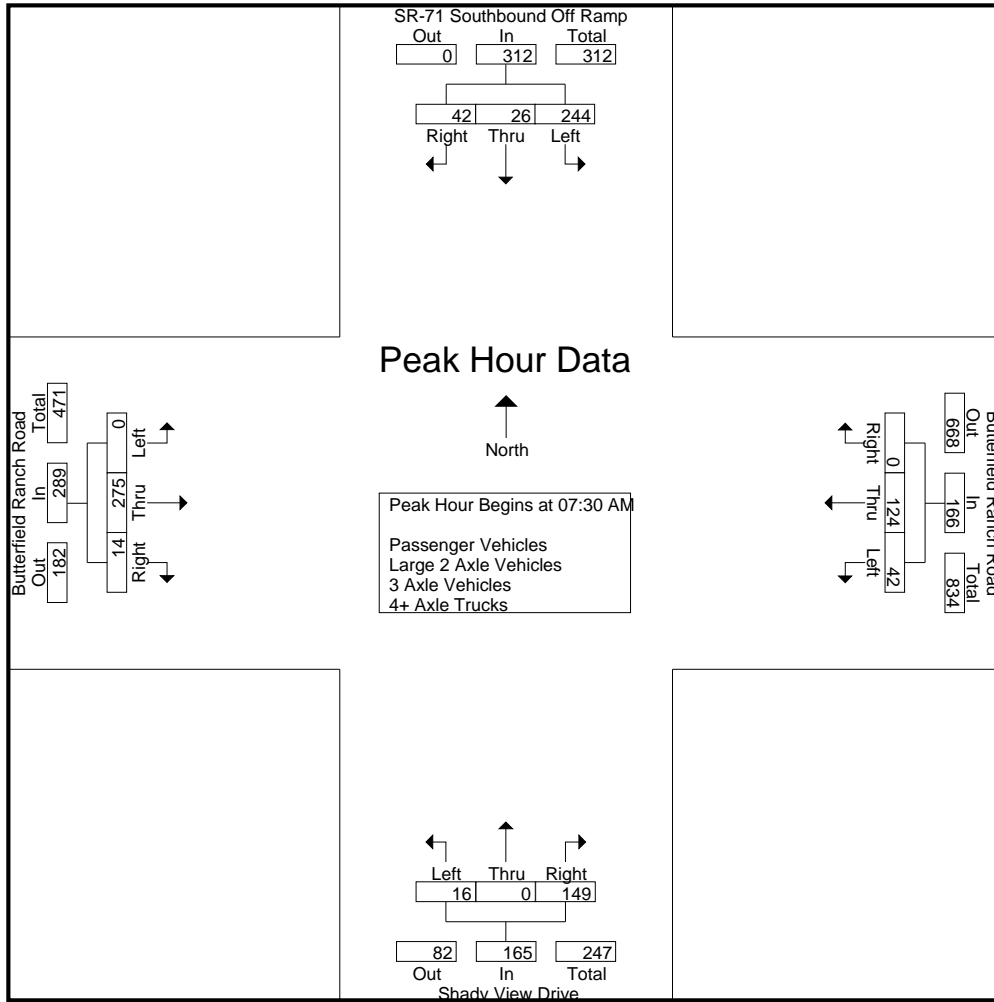
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	33	1	9	43	6	25	0	31	3	0	22	25	0	55	1	56	155
07:15 AM	41	2	5	48	12	25	0	37	3	0	40	43	0	65	3	68	196
07:30 AM	57	2	11	70	10	23	0	33	2	0	40	42	0	76	7	83	228
07:45 AM	68	8	7	83	10	31	0	41	7	0	37	44	0	78	4	82	250
Total	199	13	32	244	38	104	0	142	15	0	139	154	0	274	15	289	829
08:00 AM	55	6	8	69	12	35	0	47	4	0	32	36	0	46	1	47	199
08:15 AM	64	10	16	90	10	35	0	45	3	0	40	43	0	75	2	77	255
08:30 AM	51	5	11	67	7	29	0	36	3	0	34	37	0	65	4	69	209
08:45 AM	54	10	10	74	8	43	0	51	9	0	34	43	0	68	1	69	237
Total	224	31	45	300	37	142	0	179	19	0	140	159	0	254	8	262	900
Grand Total	423	44	77	544	75	246	0	321	34	0	279	313	0	528	23	551	1729
Apprch %	77.8	8.1	14.2		23.4	76.6	0		10.9	0	89.1		0	95.8	4.2		
Total %	24.5	2.5	4.5	31.5	4.3	14.2	0	18.6	2	0	16.1	18.1	0	30.5	1.3	31.9	
Passenger Vehicles	375	42	74	491	66	235	0	301	33	0	278	311	0	513	22	535	1638
% Passenger Vehicles	88.7	95.5	96.1	90.3	88	95.5	0	93.8	97.1	0	99.6	99.4	0	97.2	95.7	97.1	94.7
Large 2 Axle Vehicles	15	2	3	20	6	9	0	15	1	0	1	2	0	15	1	16	53
% Large 2 Axle Vehicles	3.5	4.5	3.9	3.7	8	3.7	0	4.7	2.9	0	0.4	0.6	0	2.8	4.3	2.9	3.1
3 Axle Vehicles	12	0	0	12	0	1	0	1	0	0	0	0	0	0	0	0	13
% 3 Axle Vehicles	2.8	0	0	2.2	0	0.4	0	0.3	0	0	0	0	0	0	0	0	0.8
4+ Axle Trucks	21	0	0	21	3	1	0	4	0	0	0	0	0	0	0	0	25
% 4+ Axle Trucks	5	0	0	3.9	4	0.4	0	1.2	0	0	0	0	0	0	0	0	1.4

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	57	2	11	70	10	23	0	33	2	0	40	42	0	76	7	83	228
07:45 AM	68	8	7	83	10	31	0	41	7	0	37	44	0	78	4	82	250
08:00 AM	55	6	8	69	12	35	0	47	4	0	32	36	0	46	1	47	199
08:15 AM	64	10	16	90	10	35	0	45	3	0	40	43	0	75	2	77	255
Total Volume	244	26	42	312	42	124	0	166	16	0	149	165	0	275	14	289	932
% App. Total	78.2	8.3	13.5		25.3	74.7	0		9.7	0	90.3		0	95.2	4.8		
PHF	.897	.650	.656	.867	.875	.886	.000	.883	.571	.000	.931	.938	.000	.881	.500	.870	.914

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:15 AM				07:00 AM			
+0 mins.	57	2	11	70	12	35	0	47	3	0	40	43	0	55	1	56
+15 mins.	68	8	7	83	10	35	0	45	2	0	40	42	0	65	3	68
+30 mins.	55	6	8	69	7	29	0	36	7	0	37	44	0	76	7	83
+45 mins.	64	10	16	90	8	43	0	51	4	0	32	36	0	78	4	82
Total Volume	244	26	42	312	37	142	0	179	16	0	149	165	0	274	15	289
% App. Total	78.2	8.3	13.5		20.7	79.3	0		9.7	0	90.3		0	94.8	5.2	
PHF	.897	.650	.656	.867	.771	.826	.000	.877	.571	.000	.931	.938	.000	.878	.536	.870

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

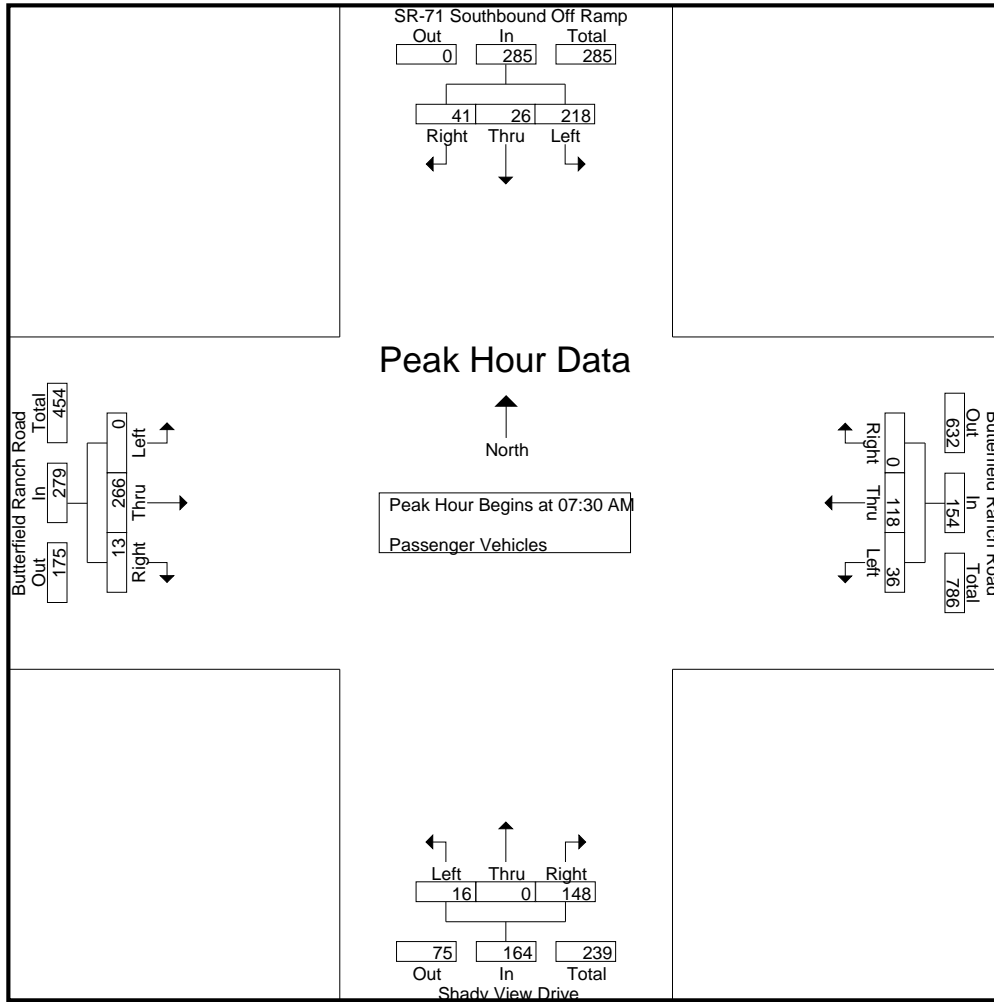
Groups Printed- Passenger Vehicles

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	29	1	8	38	6	23	0	29	3	0	22	25	0	53	1	54	146
07:15 AM	36	1	4	41	9	24	0	33	2	0	40	42	0	63	3	66	182
07:30 AM	56	2	11	69	6	20	0	26	2	0	40	42	0	72	6	78	215
07:45 AM	59	8	7	74	10	30	0	40	7	0	37	44	0	74	4	78	236
Total	180	12	30	222	31	97	0	128	14	0	139	153	0	262	14	276	779
08:00 AM	49	6	7	62	10	33	0	43	4	0	31	35	0	46	1	47	187
08:15 AM	54	10	16	80	10	35	0	45	3	0	40	43	0	74	2	76	244
08:30 AM	42	5	11	58	7	28	0	35	3	0	34	37	0	63	4	67	197
08:45 AM	50	9	10	69	8	42	0	50	9	0	34	43	0	68	1	69	231
Total	195	30	44	269	35	138	0	173	19	0	139	158	0	251	8	259	859
Grand Total	375	42	74	491	66	235	0	301	33	0	278	311	0	513	22	535	1638
Apprch %	76.4	8.6	15.1		21.9	78.1	0		10.6	0	89.4		0	95.9	4.1		
Total %	22.9	2.6	4.5	30	4	14.3	0	18.4	2	0	17	19	0	31.3	1.3	32.7	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	56	2	11	69	6	20	0	26	2	0	40	42	0	72	6	78	215
07:45 AM	59	8	7	74	10	30	0	40	7	0	37	44	0	74	4	78	236
08:00 AM	49	6	7	62	10	33	0	43	4	0	31	35	0	46	1	47	187
08:15 AM	54	10	16	80	10	35	0	45	3	0	40	43	0	74	2	76	244
Total Volume	218	26	41	285	36	118	0	154	16	0	148	164	0	266	13	279	882
% App. Total	76.5	9.1	14.4		23.4	76.6	0		9.8	0	90.2		0	95.3	4.7		
PHF	.924	.650	.641	.891	.900	.843	.000	.856	.571	.000	.925	.932	.000	.899	.542	.894	.904

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

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 Site Code : 05720438
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM							
+0 mins.	56	2	11	69	6	20	0	26	2	0	40	42	0	72	6	78
+15 mins.	59	8	7	74	10	30	0	40	7	0	37	44	0	74	4	78
+30 mins.	49	6	7	62	10	33	0	43	4	0	31	35	0	46	1	47
+45 mins.	54	10	16	80	10	35	0	45	3	0	40	43	0	74	2	76
Total Volume	218	26	41	285	36	118	0	154	16	0	148	164	0	266	13	279
% App. Total	76.5	9.1	14.4		23.4	76.6	0		9.8	0	90.2		0	95.3	4.7	
PHF	.924	.650	.641	.891	.900	.843	.000	.856	.571	.000	.925	.932	.000	.899	.542	.894

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
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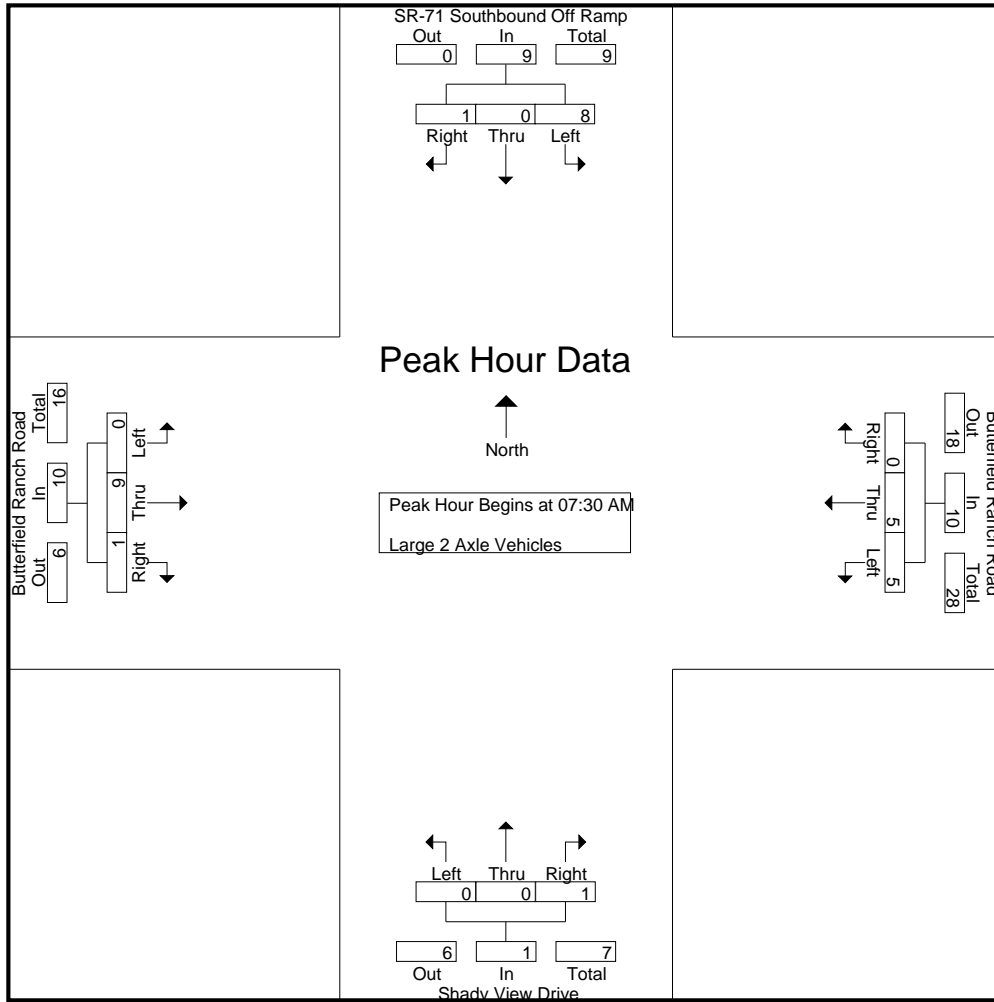
Groups Printed- Large 2 Axle Vehicles

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	2	0	1	3	0	2	0	2	0	0	0	0	0	2	0	2	7
07:15 AM	0	1	1	2	1	1	0	2	1	0	0	1	0	2	0	2	7
07:30 AM	0	0	0	0	3	3	0	6	0	0	0	0	0	4	1	5	11
07:45 AM	3	0	0	3	0	1	0	1	0	0	0	0	0	4	0	4	8
Total	5	1	2	8	4	7	0	11	1	0	0	1	0	12	1	13	33
08:00 AM	0	0	1	1	2	1	0	3	0	0	1	1	0	0	0	0	5
08:15 AM	5	0	0	5	0	0	0	0	0	0	0	0	0	1	0	1	6
08:30 AM	2	0	0	2	0	1	0	1	0	0	0	0	0	2	0	2	5
08:45 AM	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	10	1	1	12	2	2	0	4	0	0	1	1	0	3	0	3	20
Grand Total	15	2	3	20	6	9	0	15	1	0	1	2	0	15	1	16	53
Apprch %	75	10	15		40	60	0		50	0	50		0	93.8	6.2		
Total %	28.3	3.8	5.7	37.7	11.3	17	0	28.3	1.9	0	1.9	3.8	0	28.3	1.9	30.2	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	3	3	0	6	0	0	0	0	0	4	1	5	11
07:45 AM	3	0	0	3	0	1	0	1	0	0	0	0	0	4	0	4	8
08:00 AM	0	0	1	1	2	1	0	3	0	0	1	1	0	0	0	0	5
08:15 AM	5	0	0	5	0	0	0	0	0	0	0	0	0	1	0	1	6
Total Volume	8	0	1	9	5	5	0	10	0	0	1	1	0	9	1	10	30
% App. Total	88.9	0	11.1		50	50	0		0	0	100		0	90	10		
PHF	.400	.000	.250	.450	.417	.417	.000	.417	.000	.000	.250	.250	.000	.563	.250	.500	.682

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	3	3	0	6	0	0	0	0	0	4	1	5
+15 mins.	3	0	0	3	0	1	0	1	0	0	0	0	0	4	0	4
+30 mins.	0	0	1	1	2	1	0	3	0	0	1	1	0	0	0	0
+45 mins.	5	0	0	5	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	8	0	1	9	5	5	0	10	0	0	1	1	0	9	1	10
% App. Total	88.9	0	11.1		50	50	0		0	0	100		0	90	10	
PHF	.400	.000	.250	.450	.417	.417	.000	.417	.000	.000	.250	.250	.000	.563	.250	.500

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

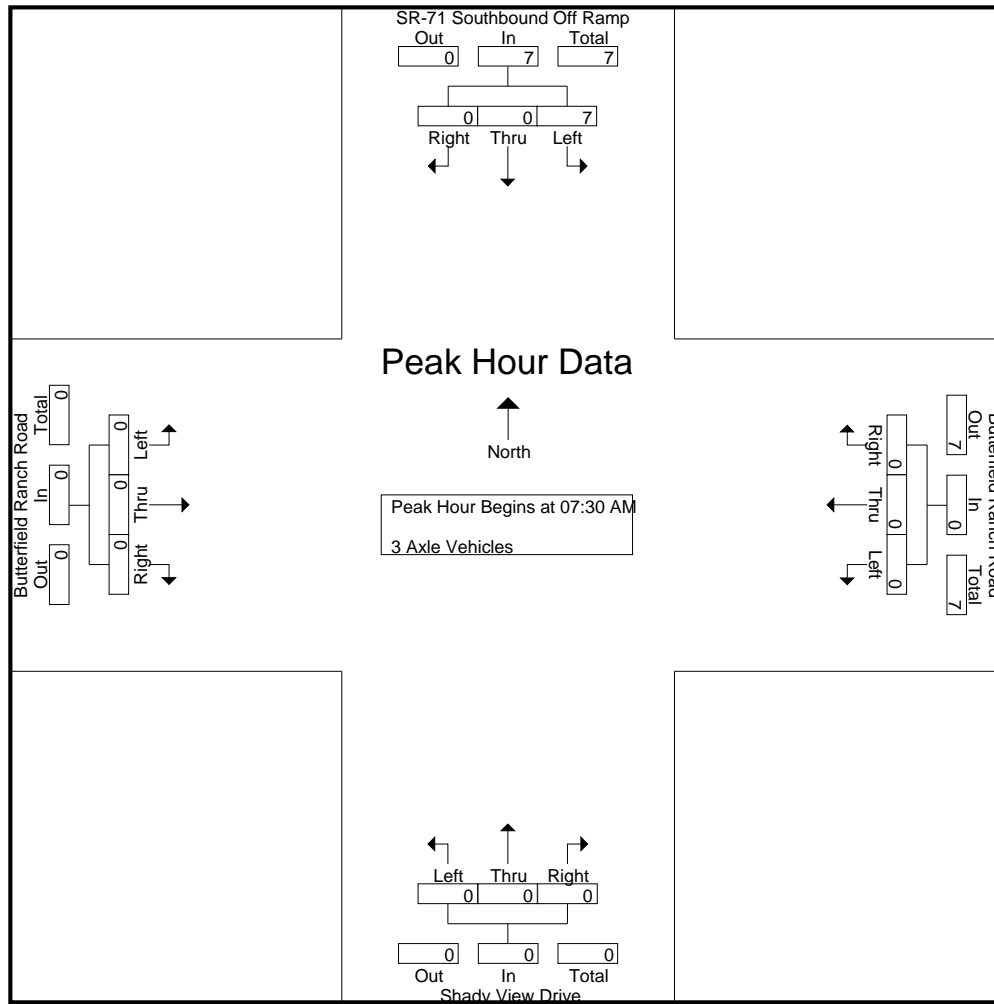
Groups Printed- 3 Axle Vehicles

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
07:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
08:00 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:30 AM	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1
Total	8	0	0	8	0	1	0	1	0	0	0	0	0	0	0	0	0	9
Grand Total	12	0	0	12	0	1	0	1	0	0	0	0	0	0	0	0	0	13
Apprch %	100	0	0		0	100	0		0	0	0		0	0	0			
Total %	92.3	0	0	92.3	0	7.7	0	7.7	0	0	0	0	0	0	0	0	0	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:30 AM																		
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:00 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	7
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0			
PHF	.583	.000	.000	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.583

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0	
PHF	.583	.000	.000	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

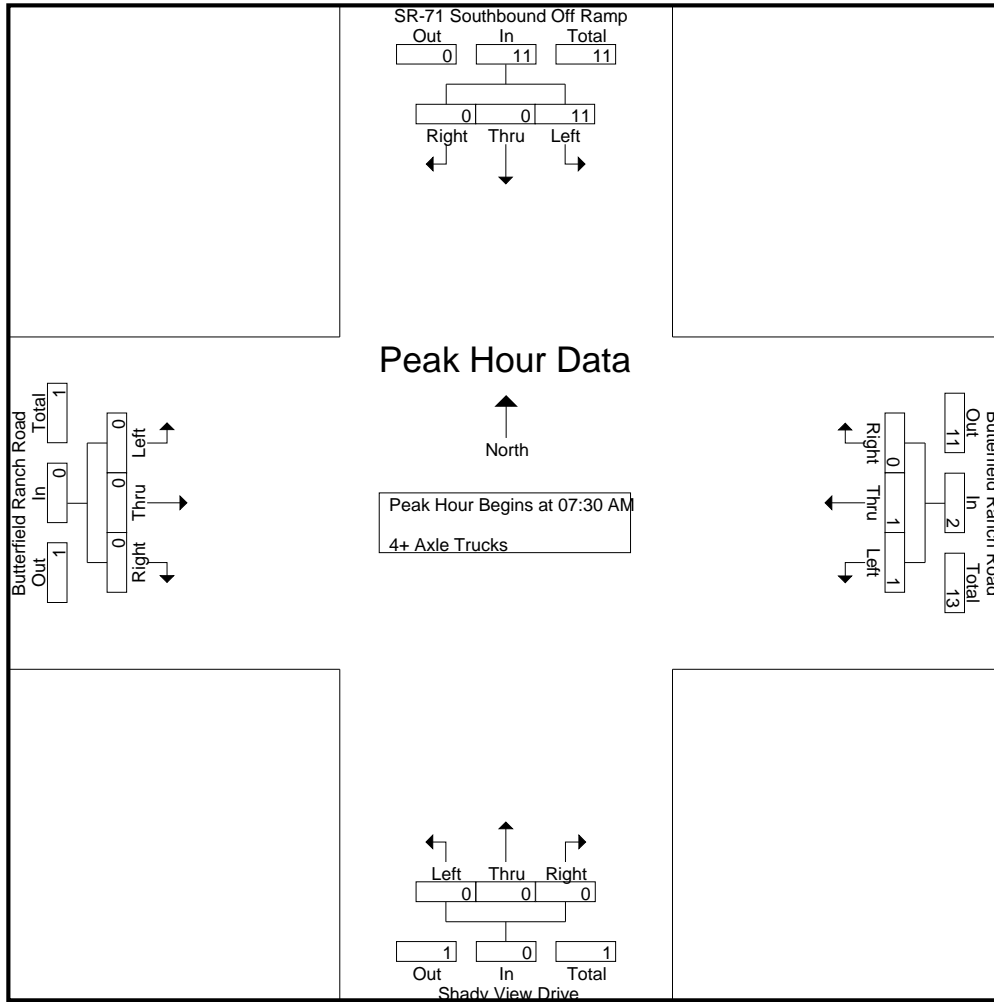
Groups Printed- 4+ Axle Trucks

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
07:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:15 AM	4	0	0	4	2	0	0	2	0	0	0	0	0	0	0	0	0	6
07:30 AM	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	2
07:45 AM	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	10	0	0	10	3	0	0	3	0	0	0	0	0	0	0	0	0	13
08:00 AM	4	0	0	4	0	1	0	1	0	0	0	0	0	0	0	0	0	5
08:15 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
08:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	11	0	0	11	0	1	0	1	0	0	0	0	0	0	0	0	0	12
Grand Total	21	0	0	21	3	1	0	4	0	0	0	0	0	0	0	0	0	25
Apprch %	100	0	0		75	25	0		0	0	0		0	0	0			
Total %	84	0	0	84	12	4	0	16	0	0	0	0	0	0	0	0	0	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:30 AM																		
07:30 AM	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	2
07:45 AM	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
08:00 AM	4	0	0	4	0	1	0	1	0	0	0	0	0	0	0	0	0	5
08:15 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	11	0	0	11	1	1	0	2	0	0	0	0	0	0	0	0	0	13
% App. Total	100	0	0		50	50	0		0	0	0		0	0	0			
PHF	.688	.000	.000	.688	.250	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.650

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0
+15 mins.	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	4	0	0	4	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	11	0	0	11	1	1	0	2	0	0	0	0	0	0	0	0
% App. Total	100	0	0		50	50	0		0	0	0		0	0	0	
PHF	.688	.000	.000	.688	.250	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

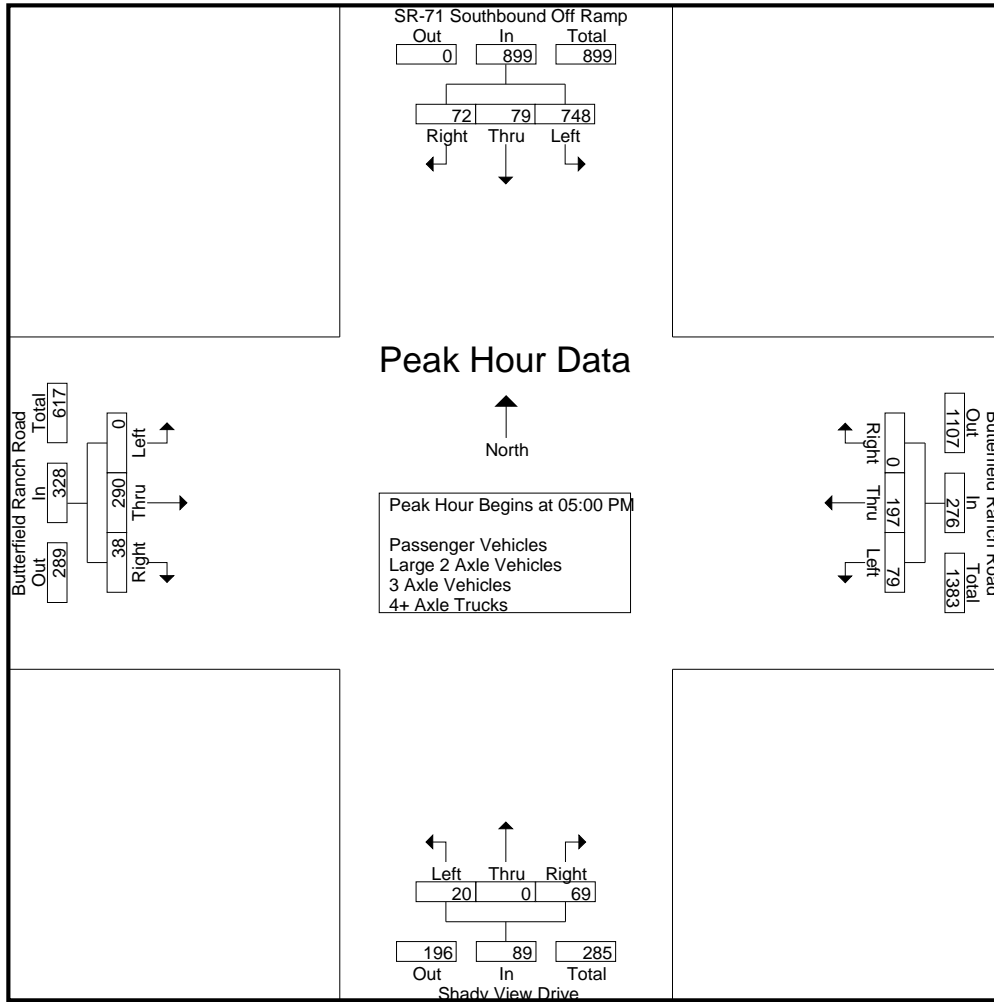
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	220	19	14	253	15	52	0	67	7	0	30	37	0	68	6	74	431
04:15 PM	154	20	17	191	15	47	0	62	6	0	20	26	0	74	10	84	363
04:30 PM	184	16	15	215	15	53	0	68	6	0	28	34	0	79	12	91	408
04:45 PM	138	11	10	159	21	45	0	66	7	0	20	27	0	70	6	76	328
Total	696	66	56	818	66	197	0	263	26	0	98	124	0	291	34	325	1530
05:00 PM	175	13	16	204	17	56	0	73	5	0	18	23	0	62	4	66	366
05:15 PM	194	18	24	236	26	52	0	78	5	0	16	21	0	82	15	97	432
05:30 PM	214	28	17	259	18	49	0	67	4	0	21	25	0	78	6	84	435
05:45 PM	165	20	15	200	18	40	0	58	6	0	14	20	0	68	13	81	359
Total	748	79	72	899	79	197	0	276	20	0	69	89	0	290	38	328	1592
Grand Total	1444	145	128	1717	145	394	0	539	46	0	167	213	0	581	72	653	3122
Apprch %	84.1	8.4	7.5		26.9	73.1	0		21.6	0	78.4		0	89	11		
Total %	46.3	4.6	4.1	55	4.6	12.6	0	17.3	1.5	0	5.3	6.8	0	18.6	2.3	20.9	
Passenger Vehicles	1416	143	126	1685	144	392	0	536	44	0	164	208	0	573	71	644	3073
% Passenger Vehicles	98.1	98.6	98.4	98.1	99.3	99.5	0	99.4	95.7	0	98.2	97.7	0	98.6	98.6	98.6	98.4
Large 2 Axle Vehicles	17	2	2	21	1	2	0	3	2	0	3	5	0	8	1	9	38
% Large 2 Axle Vehicles	1.2	1.4	1.6	1.2	0.7	0.5	0	0.6	4.3	0	1.8	2.3	0	1.4	1.4	1.4	1.2
3 Axle Vehicles	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% 3 Axle Vehicles	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0.1
4+ Axle Trucks	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
% 4+ Axle Trucks	0.6	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0.3

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	175	13	16	204	17	56	0	73	5	0	18	23	0	62	4	66	366
05:15 PM	194	18	24	236	26	52	0	78	5	0	16	21	0	82	15	97	432
05:30 PM	214	28	17	259	18	49	0	67	4	0	21	25	0	78	6	84	435
05:45 PM	165	20	15	200	18	40	0	58	6	0	14	20	0	68	13	81	359
Total Volume	748	79	72	899	79	197	0	276	20	0	69	89	0	290	38	328	1592
% App. Total	83.2	8.8	8		28.6	71.4	0		22.5	0	77.5		0	88.4	11.6		
PHF	.874	.705	.750	.868	.760	.879	.000	.885	.833	.000	.821	.890	.000	.884	.633	.845	.915

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				04:30 PM				04:00 PM				04:30 PM			
+0 mins.	175	13	16	204	15	53	0	68	7	0	30	37	0	79	12	91
+15 mins.	194	18	24	236	21	45	0	66	6	0	20	26	0	70	6	76
+30 mins.	214	28	17	259	17	56	0	73	6	0	28	34	0	62	4	66
+45 mins.	165	20	15	200	26	52	0	78	7	0	20	27	0	82	15	97
Total Volume	748	79	72	899	79	206	0	285	26	0	98	124	0	293	37	330
% App. Total	83.2	8.8	8		27.7	72.3	0		21	0	79		0	88.8	11.2	
PHF	.874	.705	.750	.868	.760	.920	.000	.913	.929	.000	.817	.838	.000	.893	.617	.851

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

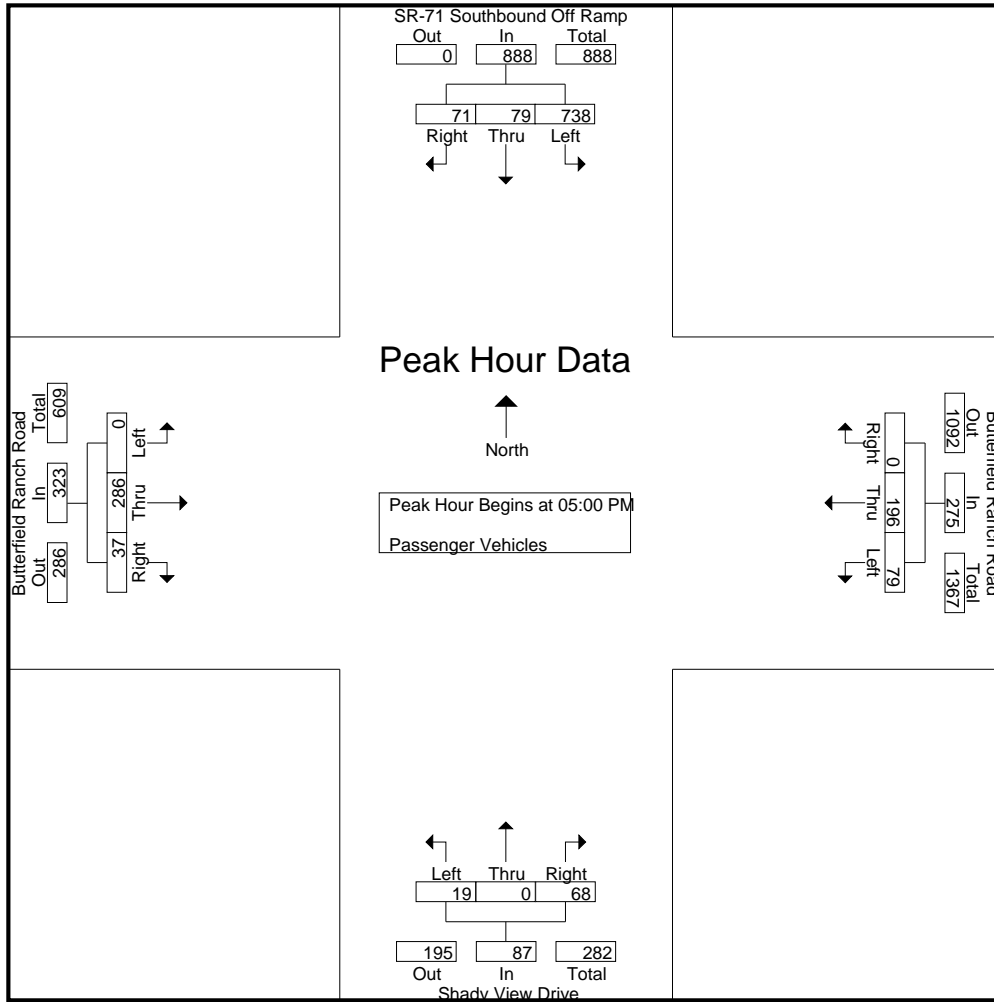
Groups Printed- Passenger Vehicles

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	214	18	14	246	14	52	0	66	7	0	29	36	0	67	6	73	421
04:15 PM	150	20	17	187	15	47	0	62	6	0	19	25	0	73	10	83	357
04:30 PM	179	15	15	209	15	53	0	68	5	0	28	33	0	78	12	90	400
04:45 PM	135	11	9	155	21	44	0	65	7	0	20	27	0	69	6	75	322
Total	678	64	55	797	65	196	0	261	25	0	96	121	0	287	34	321	1500
05:00 PM	170	13	16	199	17	56	0	73	4	0	18	22	0	61	4	65	359
05:15 PM	191	18	24	233	26	52	0	78	5	0	16	21	0	82	15	97	429
05:30 PM	212	28	16	256	18	48	0	66	4	0	20	24	0	77	5	82	428
05:45 PM	165	20	15	200	18	40	0	58	6	0	14	20	0	66	13	79	357
Total	738	79	71	888	79	196	0	275	19	0	68	87	0	286	37	323	1573
Grand Total	1416	143	126	1685	144	392	0	536	44	0	164	208	0	573	71	644	3073
Apprch %	84	8.5	7.5		26.9	73.1	0		21.2	0	78.8		0	89	11		
Total %	46.1	4.7	4.1	54.8	4.7	12.8	0	17.4	1.4	0	5.3	6.8	0	18.6	2.3	21	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	170	13	16	199	17	56	0	73	4	0	18	22	0	61	4	65	359
05:15 PM	191	18	24	233	26	52	0	78	5	0	16	21	0	82	15	97	429
05:30 PM	212	28	16	256	18	48	0	66	4	0	20	24	0	77	5	82	428
05:45 PM	165	20	15	200	18	40	0	58	6	0	14	20	0	66	13	79	357
Total Volume	738	79	71	888	79	196	0	275	19	0	68	87	0	286	37	323	1573
% App. Total	83.1	8.9	8		28.7	71.3	0		21.8	0	78.2		0	88.5	11.5		
PHF	.870	.705	.740	.867	.760	.875	.000	.881	.792	.000	.850	.906	.000	.872	.617	.832	.917

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	170	13	16	199	17	56	0	73	4	0	18	22	0	61	4	65
+15 mins.	191	18	24	233	26	52	0	78	5	0	16	21	0	82	15	97
+30 mins.	212	28	16	256	18	48	0	66	4	0	20	24	0	77	5	82
+45 mins.	165	20	15	200	18	40	0	58	6	0	14	20	0	66	13	79
Total Volume	738	79	71	888	79	196	0	275	19	0	68	87	0	286	37	323
% App. Total	83.1	8.9	8		28.7	71.3	0		21.8	0	78.2		0	88.5	11.5	
PHF	.870	.705	.740	.867	.760	.875	.000	.881	.792	.000	.850	.906	.000	.872	.617	.832

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

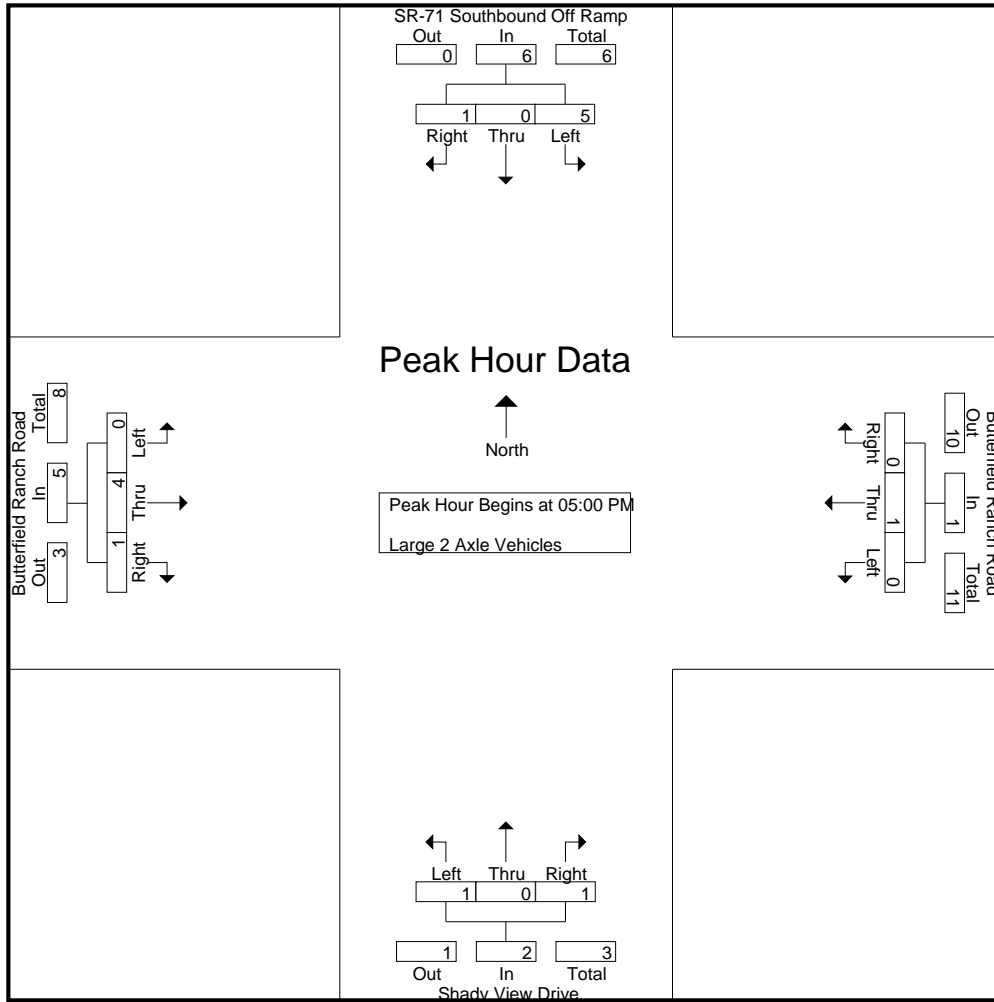
Groups Printed- Large 2 Axle Vehicles

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	4	1	0	5	1	0	0	1	0	0	1	1	0	1	0	1	8
04:15 PM	1	0	0	1	0	0	0	0	0	0	1	1	0	1	0	1	3
04:30 PM	4	1	0	5	0	0	0	0	1	0	0	1	0	1	0	1	7
04:45 PM	3	0	1	4	0	1	0	1	0	0	0	0	0	1	0	1	6
Total	12	2	1	15	1	1	0	2	1	0	2	3	0	4	0	4	24
05:00 PM	2	0	0	2	0	0	0	0	1	0	0	1	0	1	0	1	4
05:15 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	1	0	1	2	0	1	0	1	0	0	1	1	0	1	1	2	6
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total	5	0	1	6	0	1	0	1	1	0	1	2	0	4	1	5	14
Grand Total	17	2	2	21	1	2	0	3	2	0	3	5	0	8	1	9	38
Apprch %	81	9.5	9.5		33.3	66.7	0		40	0	60		0	88.9	11.1		
Total %	44.7	5.3	5.3	55.3	2.6	5.3	0	7.9	5.3	0	7.9	13.2	0	21.1	2.6	23.7	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	0	0	2	0	0	0	0	1	0	0	1	0	1	0	1	4
05:15 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:30 PM	1	0	1	2	0	1	0	1	0	0	1	1	0	1	1	2	6
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	5	0	1	6	0	1	0	1	1	0	1	2	0	4	1	5	14
% App. Total	83.3	0	16.7		0	100	0		50	0	50		0	80	20		
PHF	.625	.000	.250	.750	.000	.250	.000	.250	.250	.000	.250	.500	.000	.500	.250	.625	.583

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	2	0	0	2	0	0	0	0	1	0	0	1	0	1	0	1
+15 mins.	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	1	2	0	1	0	1	0	0	1	1	0	1	1	2
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Total Volume	5	0	1	6	0	1	0	1	1	0	1	2	0	4	1	5
% App. Total	83.3	0	16.7		0	100	0		50	0	50		0	80	20	
PHF	.625	.000	.250	.750	.000	.250	.000	.250	.250	.000	.250	.500	.000	.500	.250	.625

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

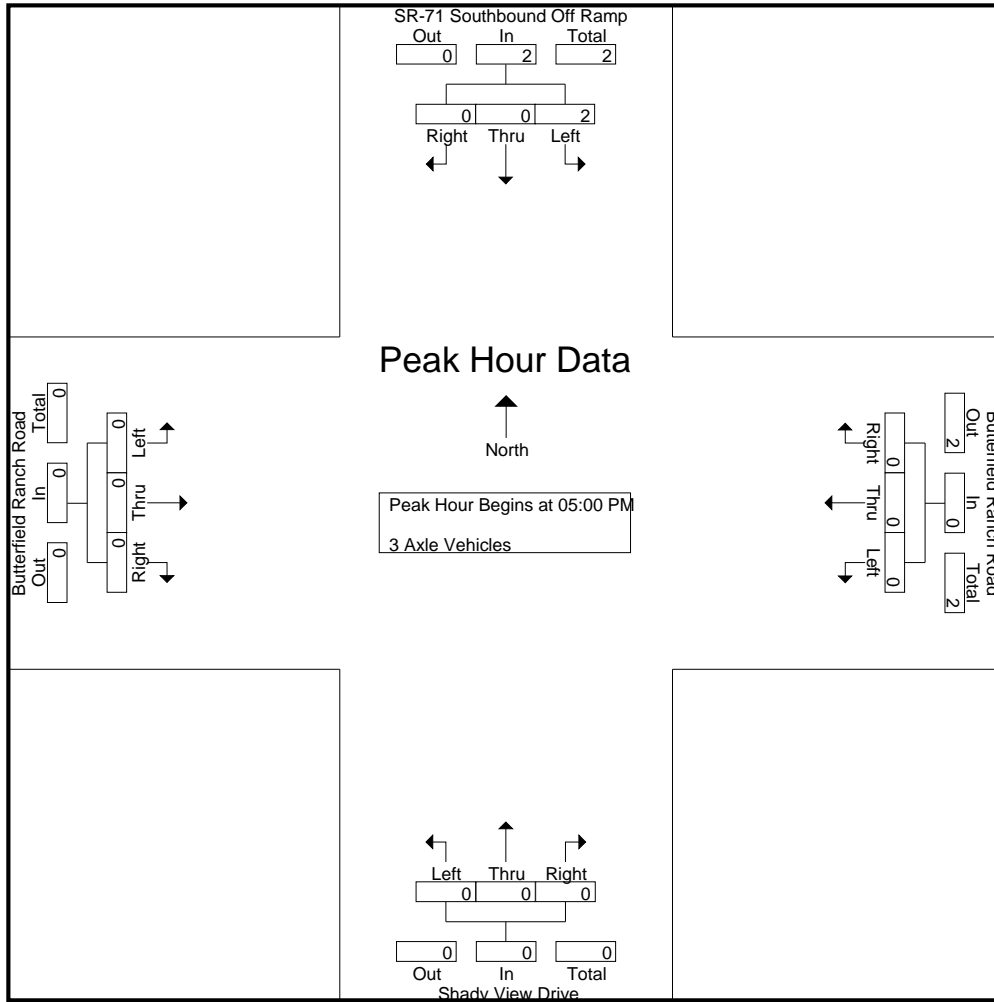
Groups Printed- 3 Axle Vehicles

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Grand Total	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Apprch %	100	0	0		0	0	0		0	0	0		0	0	0		
Total %	100	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0		
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0	
PHF	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

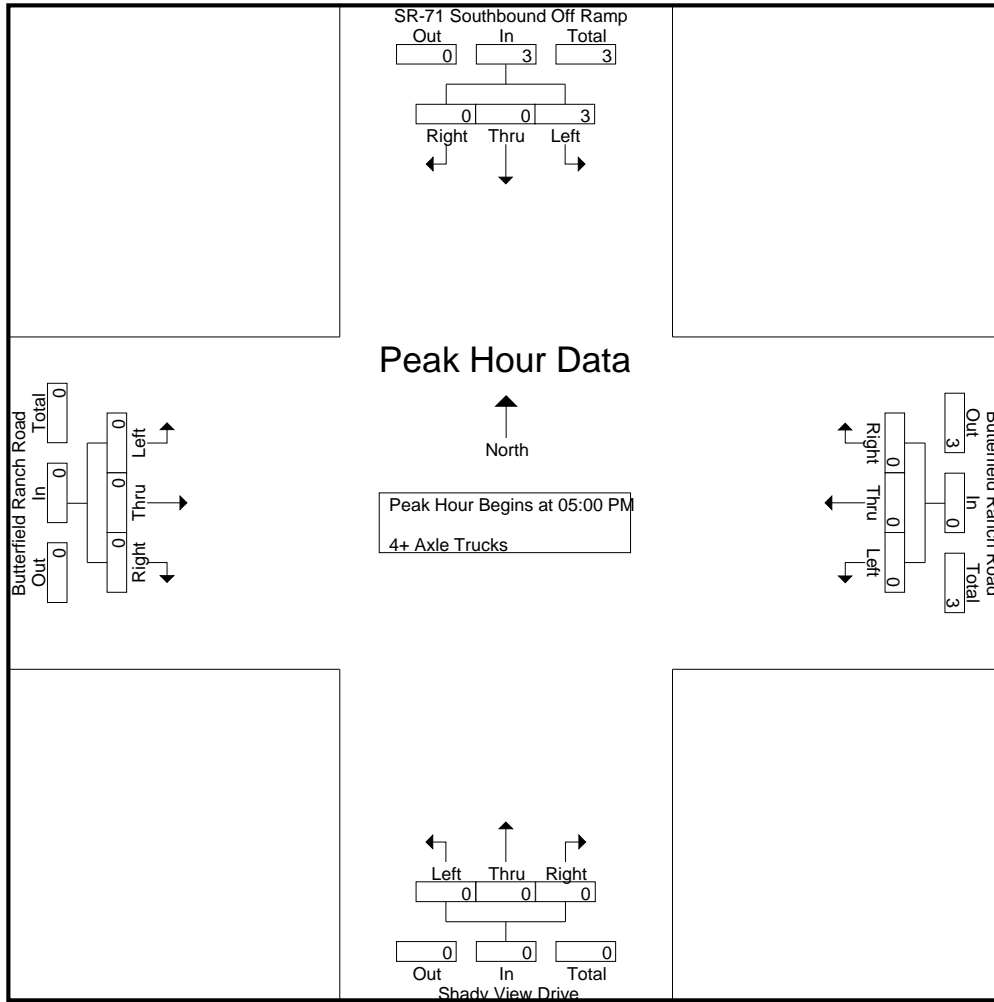
Groups Printed- 4+ Axle Trucks

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
04:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
05:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Grand Total	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Apprch %	100	0	0		0	0	0		0	0	0		0	0	0			
Total %	100	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0		

Start Time	SR-71 Southbound Off Ramp Southbound				Butterfield Ranch Road Westbound				Shady View Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0			
PHF	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375

City of Chino Hills
 N/S: SR-71 SB Off Ramp/Shady View Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 02_CHH_Shady_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0		0	0	0		0	0	0		0	0	0	
PHF	.375	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

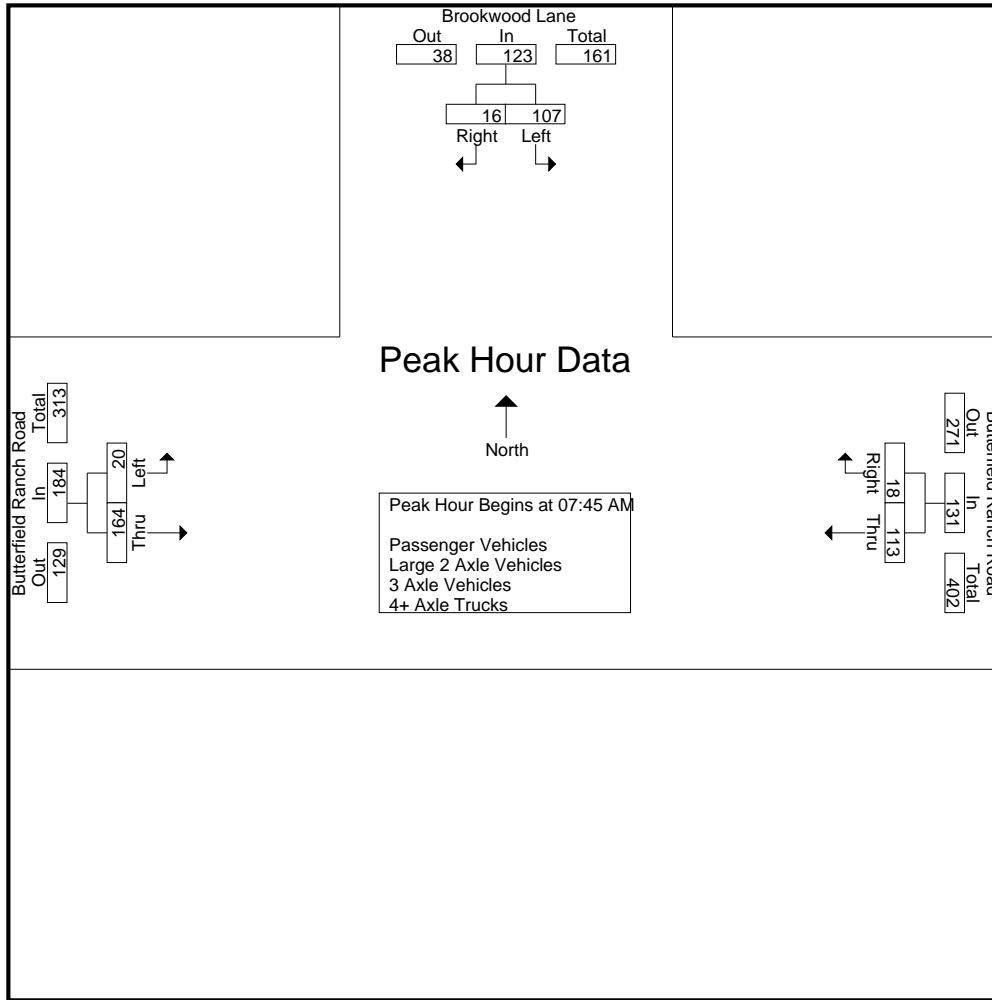
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:00 AM	28	4	32	13	2	15	3	36	39	86
07:15 AM	26	1	27	11	5	16	3	42	45	88
07:30 AM	23	1	24	15	2	17	4	59	63	104
07:45 AM	38	4	42	29	0	29	8	43	51	122
Total	115	10	125	68	9	77	18	180	198	400
08:00 AM	13	3	16	27	8	35	2	38	40	91
08:15 AM	32	4	36	29	6	35	6	36	42	113
08:30 AM	24	5	29	28	4	32	4	47	51	112
08:45 AM	23	7	30	33	6	39	6	43	49	118
Total	92	19	111	117	24	141	18	164	182	434
Grand Total	207	29	236	185	33	218	36	344	380	834
Apprch %	87.7	12.3		84.9	15.1		9.5	90.5		
Total %	24.8	3.5	28.3	22.2	4	26.1	4.3	41.2	45.6	
Passenger Vehicles	202	27	229	182	32	214	36	340	376	819
% Passenger Vehicles	97.6	93.1	97	98.4	97	98.2	100	98.8	98.9	98.2
Large 2 Axle Vehicles	5	2	7	2	1	3	0	4	4	14
% Large 2 Axle Vehicles	2.4	6.9	3	1.1	3	1.4	0	1.2	1.1	1.7
3 Axle Vehicles	0	0	0	1	0	1	0	0	0	1
% 3 Axle Vehicles	0	0	0	0.5	0	0.5	0	0	0	0.1
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:45 AM	38	4	42	29	0	29	8	43	51	122
08:00 AM	13	3	16	27	8	35	2	38	40	91
08:15 AM	32	4	36	29	6	35	6	36	42	113
08:30 AM	24	5	29	28	4	32	4	47	51	112
Total Volume	107	16	123	113	18	131	20	164	184	438
% App. Total	87	13		86.3	13.7		10.9	89.1		
PHF	.704	.800	.732	.974	.563	.936	.625	.872	.902	.898

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:15 AM		
+0 mins.	28	4	32	27	8	35	3	42	45
+15 mins.	26	1	27	29	6	35	4	59	63
+30 mins.	23	1	24	28	4	32	8	43	51
+45 mins.	38	4	42	33	6	39	2	38	40
Total Volume	115	10	125	117	24	141	17	182	199
% App. Total	92	8		83	17		8.5	91.5	
PHF	.757	.625	.744	.886	.750	.904	.531	.771	.790

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- Passenger Vehicles

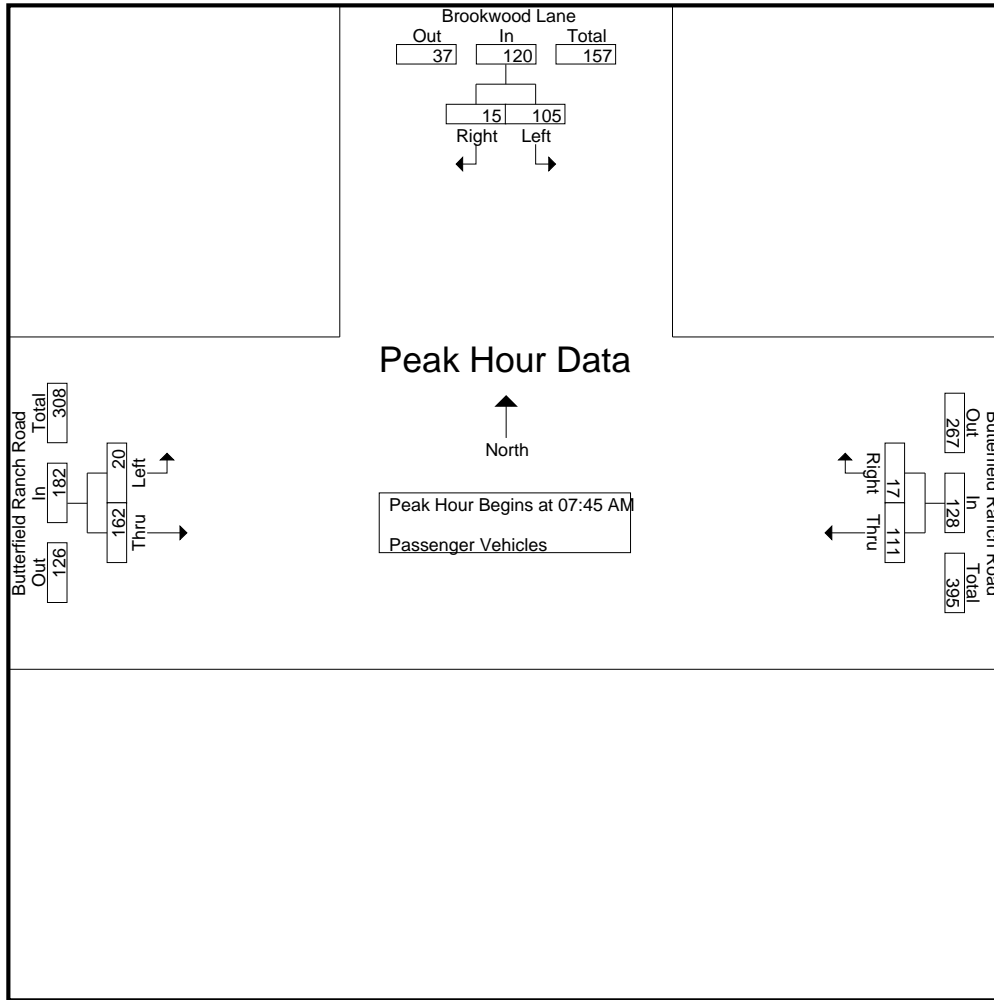
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:00 AM	28	3	31	13	2	15	3	34	37	83
07:15 AM	25	1	26	11	5	16	3	42	45	87
07:30 AM	21	1	22	15	2	17	4	59	63	102
07:45 AM	37	4	41	28	0	28	8	42	50	119
Total	111	9	120	67	9	76	18	177	195	391
08:00 AM	13	3	16	27	7	34	2	38	40	90
08:15 AM	32	3	35	29	6	35	6	35	41	111
08:30 AM	23	5	28	27	4	31	4	47	51	110
08:45 AM	23	7	30	32	6	38	6	43	49	117
Total	91	18	109	115	23	138	18	163	181	428
Grand Total	202	27	229	182	32	214	36	340	376	819
Apprch %	88.2	11.8		85	15		9.6	90.4		
Total %	24.7	3.3	28	22.2	3.9	26.1	4.4	41.5	45.9	

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:45 AM	37	4	41	28	0	28	8	42	50	119
08:00 AM	13	3	16	27	7	34	2	38	40	90
08:15 AM	32	3	35	29	6	35	6	35	41	111
08:30 AM	23	5	28	27	4	31	4	47	51	110
Total Volume	105	15	120	111	17	128	20	162	182	430
% App. Total	87.5	12.5		86.7	13.3		11	89		
PHF	.709	.750	.732	.957	.607	.914	.625	.862	.892	.903

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM			07:45 AM			07:45 AM		
+0 mins.	37	4	41	28	0	28	8	42	50
+15 mins.	13	3	16	27	7	34	2	38	40
+30 mins.	32	3	35	29	6	35	6	35	41
+45 mins.	23	5	28	27	4	31	4	47	51
Total Volume	105	15	120	111	17	128	20	162	182
% App. Total	87.5	12.5		86.7	13.3		11	89	
PHF	.709	.750	.732	.957	.607	.914	.625	.862	.892

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

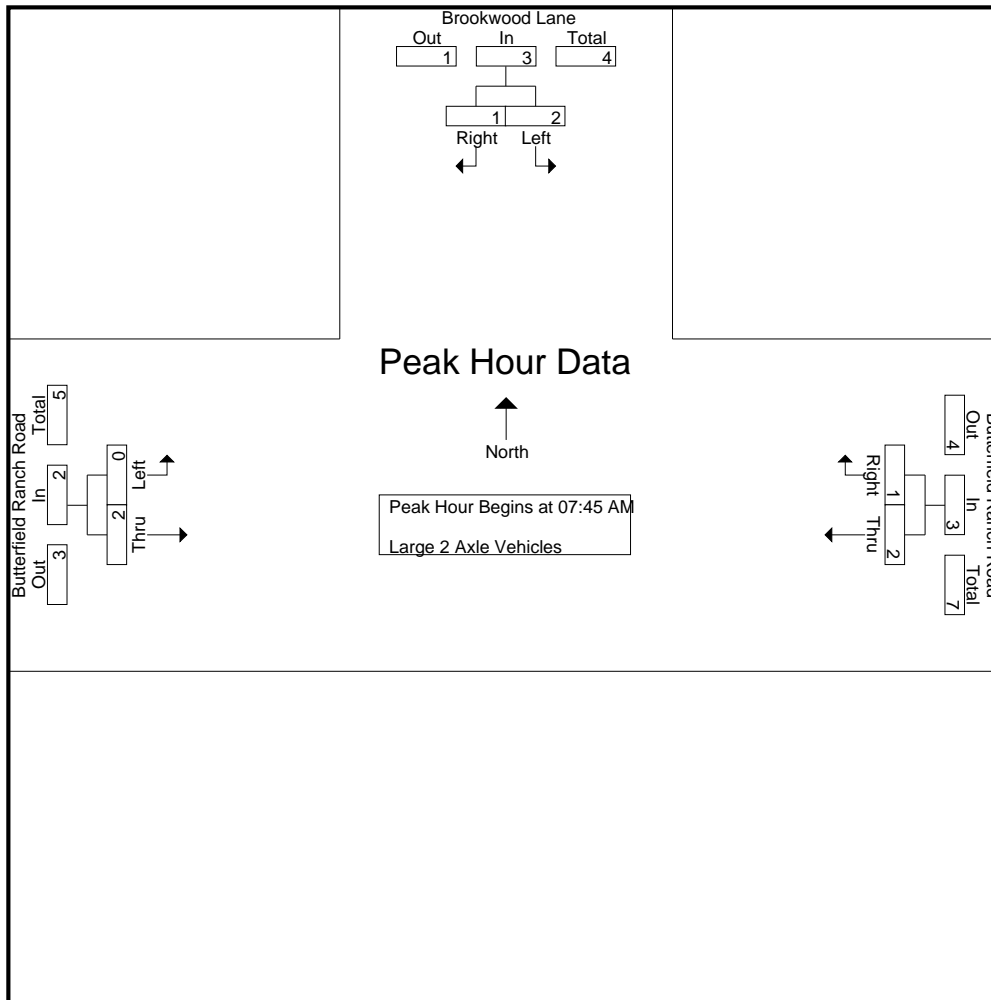
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:00 AM	0	1	1	0	0	0	0	2	2	3
07:15 AM	1	0	1	0	0	0	0	0	0	1
07:30 AM	2	0	2	0	0	0	0	0	0	2
07:45 AM	1	0	1	1	0	1	0	1	1	3
Total	4	1	5	1	0	1	0	3	3	9
08:00 AM	0	0	0	0	1	1	0	0	0	1
08:15 AM	0	1	1	0	0	0	0	1	1	2
08:30 AM	1	0	1	1	0	1	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	1	1	2	1	1	2	0	1	1	5
Grand Total	5	2	7	2	1	3	0	4	4	14
Apprch %	71.4	28.6		66.7	33.3		0	100		
Total %	35.7	14.3	50	14.3	7.1	21.4	0	28.6	28.6	

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:45 AM	1	0	1	1	0	1	0	1	1	3
08:00 AM	0	0	0	0	1	1	0	0	0	1
08:15 AM	0	1	1	0	0	0	0	1	1	2
08:30 AM	1	0	1	1	0	1	0	0	0	2
Total Volume	2	1	3	2	1	3	0	2	2	8
% App. Total	66.7	33.3		66.7	33.3		0	100		
PHF	.500	.250	.750	.500	.250	.750	.000	.500	.500	.667

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM			07:45 AM			07:45 AM		
+0 mins.	1	0	1	1	0	1	0	1	1
+15 mins.	0	0	0	0	1	1	0	0	0
+30 mins.	0	1	1	0	0	0	0	1	1
+45 mins.	1	0	1	1	0	1	0	0	0
Total Volume	2	1	3	2	1	3	0	2	2
% App. Total	66.7	33.3		66.7	33.3		0	100	
PHF	.500	.250	.750	.500	.250	.750	.000	.500	.500

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- 3 Axle Vehicles

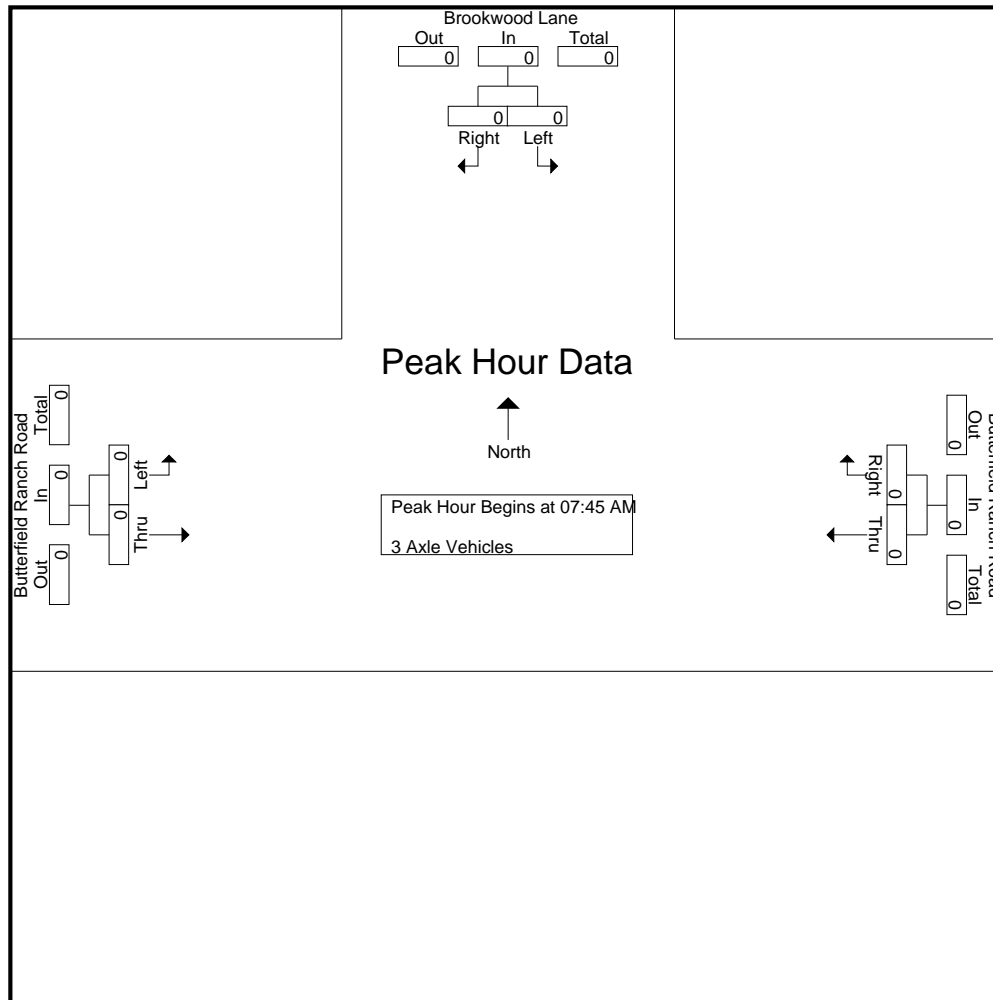
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	1	0	1	0	0	0	1
Total	0	0	0	1	0	1	0	0	0	1
Grand Total	0	0	0	1	0	1	0	0	0	1
Apprch %	0	0		100	0		0	0		
Total %	0	0		100	0	100	0	0		

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM			07:45 AM			07:45 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- 4+ Axle Trucks

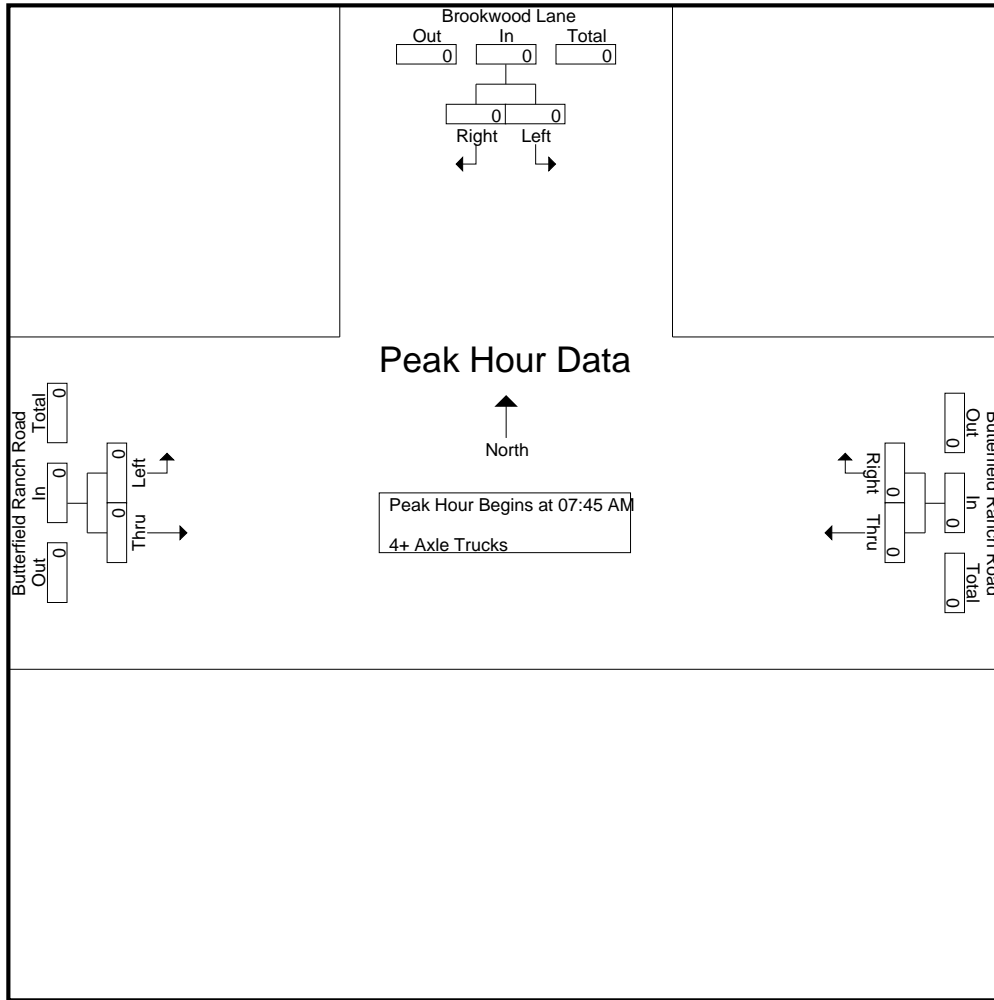
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			07:45 AM			07:45 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

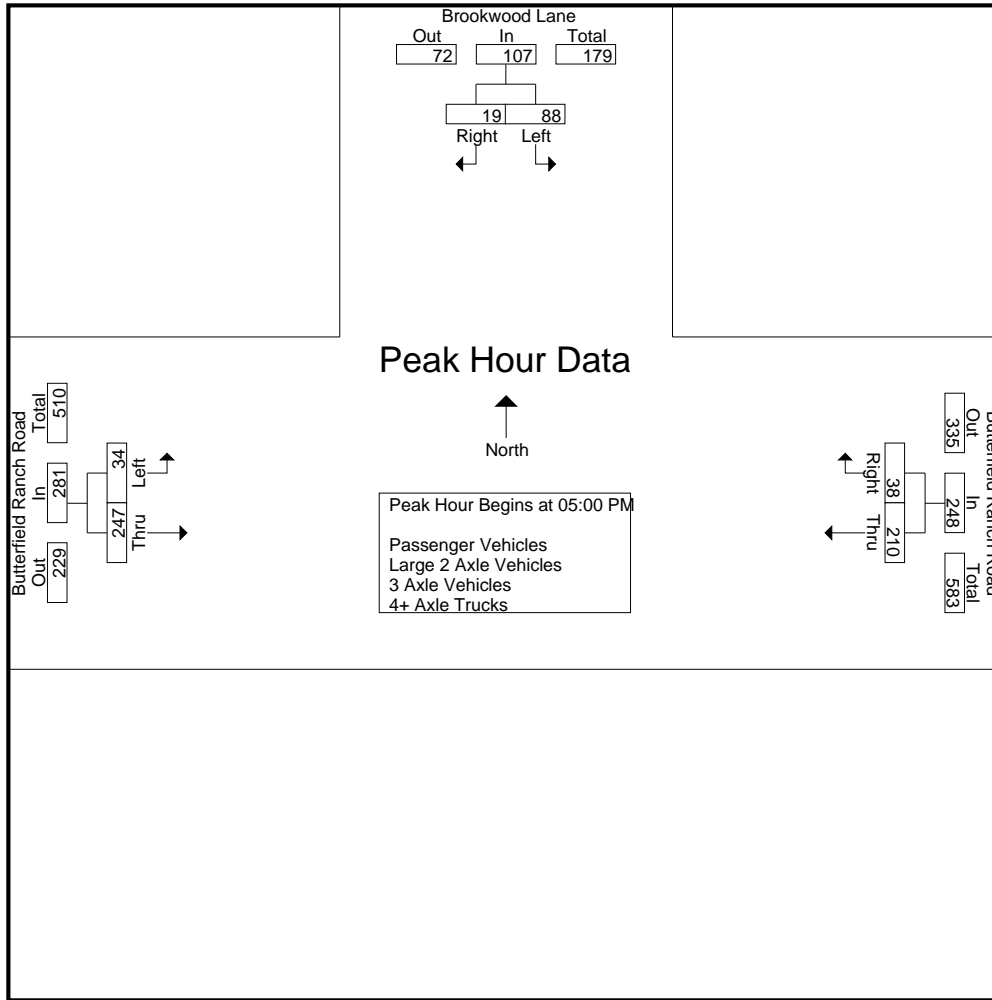
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
04:00 PM	24	5	29	50	4	54	8	47	55	138
04:15 PM	23	8	31	47	11	58	8	75	83	172
04:30 PM	34	5	39	48	9	57	6	49	55	151
04:45 PM	24	6	30	53	7	60	1	52	53	143
Total	105	24	129	198	31	229	23	223	246	604
05:00 PM	14	5	19	59	9	68	8	59	67	154
05:15 PM	23	6	29	58	13	71	8	73	81	181
05:30 PM	23	4	27	46	10	56	8	62	70	153
05:45 PM	28	4	32	47	6	53	10	53	63	148
Total	88	19	107	210	38	248	34	247	281	636
Grand Total	193	43	236	408	69	477	57	470	527	1240
Apprch %	81.8	18.2		85.5	14.5		10.8	89.2		
Total %	15.6	3.5	19	32.9	5.6	38.5	4.6	37.9	42.5	
Passenger Vehicles	189	43	232	407	69	476	57	465	522	1230
% Passenger Vehicles	97.9	100	98.3	99.8	100	99.8	100	98.9	99.1	99.2
Large 2 Axle Vehicles	4	0	4	1	0	1	0	5	5	10
% Large 2 Axle Vehicles	2.1	0	1.7	0.2	0	0.2	0	1.1	0.9	0.8
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
05:00 PM	14	5	19	59	9	68	8	59	67	154
05:15 PM	23	6	29	58	13	71	8	73	81	181
05:30 PM	23	4	27	46	10	56	8	62	70	153
05:45 PM	28	4	32	47	6	53	10	53	63	148
Total Volume	88	19	107	210	38	248	34	247	281	636
% App. Total	82.2	17.8		84.7	15.3		12.1	87.9		
PHF	.786	.792	.836	.890	.731	.873	.850	.846	.867	.878

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 05:00 PM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM			04:30 PM			05:00 PM		
+0 mins.	24	5	29	48	9	57	8	59	67
+15 mins.	23	8	31	53	7	60	8	73	81
+30 mins.	34	5	39	59	9	68	8	62	70
+45 mins.	24	6	30	58	13	71	10	53	63
Total Volume	105	24	129	218	38	256	34	247	281
% App. Total	81.4	18.6		85.2	14.8		12.1	87.9	
PHF	.772	.750	.827	.924	.731	.901	.850	.846	.867

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

Groups Printed- Passenger Vehicles

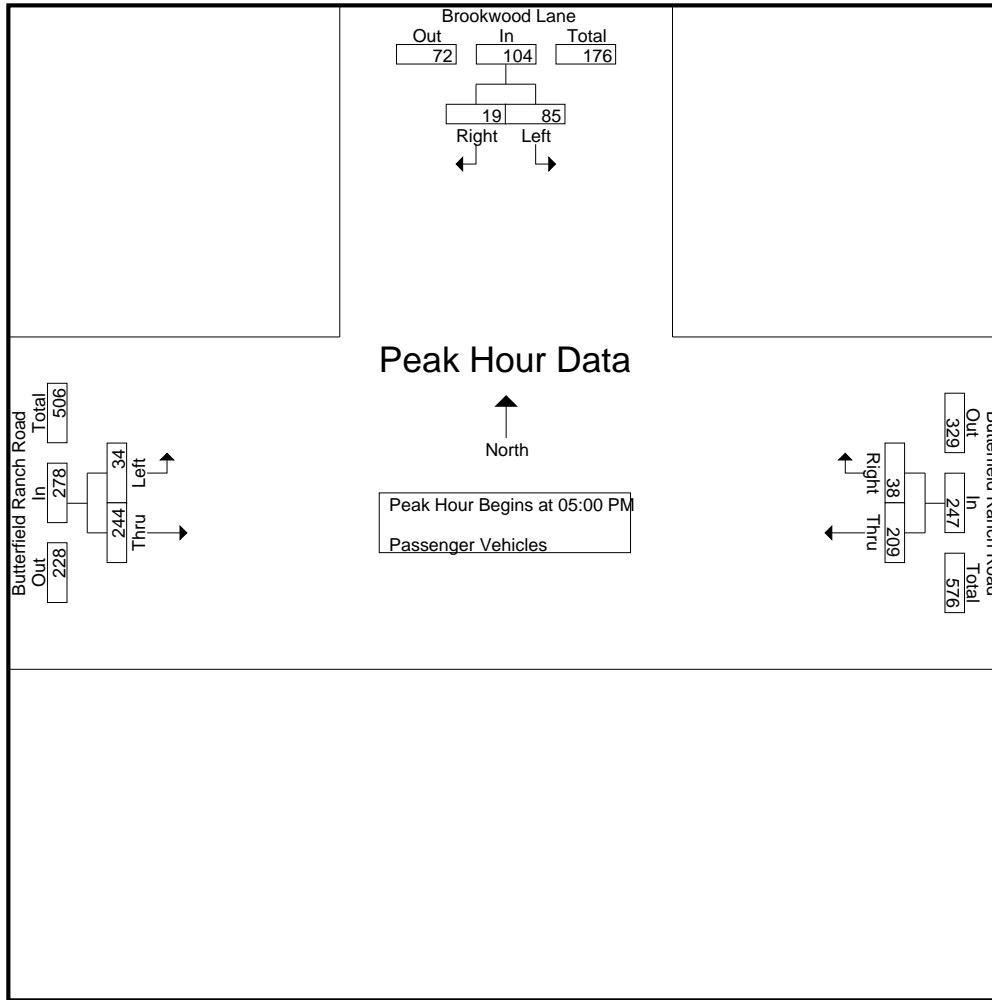
Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
04:00 PM	24	5	29	50	4	54	8	46	54	137
04:15 PM	23	8	31	47	11	58	8	74	82	171
04:30 PM	34	5	39	48	9	57	6	49	55	151
04:45 PM	23	6	29	53	7	60	1	52	53	142
Total	104	24	128	198	31	229	23	221	244	601
05:00 PM	13	5	18	58	9	67	8	59	67	152
05:15 PM	23	6	29	58	13	71	8	72	80	180
05:30 PM	23	4	27	46	10	56	8	60	68	151
05:45 PM	26	4	30	47	6	53	10	53	63	146
Total	85	19	104	209	38	247	34	244	278	629
Grand Total	189	43	232	407	69	476	57	465	522	1230
Apprch %	81.5	18.5		85.5	14.5		10.9	89.1		
Total %	15.4	3.5	18.9	33.1	5.6	38.7	4.6	37.8	42.4	

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
05:00 PM	13	5	18	58	9	67	8	59	67	152
05:15 PM	23	6	29	58	13	71	8	72	80	180
05:30 PM	23	4	27	46	10	56	8	60	68	151
05:45 PM	26	4	30	47	6	53	10	53	63	146
Total Volume	85	19	104	209	38	247	34	244	278	629
% App. Total	81.7	18.3		84.6	15.4		12.2	87.8		
PHF	.817	.792	.867	.901	.731	.870	.850	.847	.869	.874

Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 05:00 PM

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
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Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	13	5	18	58	9	67	8	59	67
+15 mins.	23	6	29	58	13	71	8	72	80
+30 mins.	23	4	27	46	10	56	8	60	68
+45 mins.	26	4	30	47	6	53	10	53	63
Total Volume	85	19	104	209	38	247	34	244	278
% App. Total	81.7	18.3		84.6	15.4		12.2	87.8	
PHF	.817	.792	.867	.901	.731	.870	.850	.847	.869

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

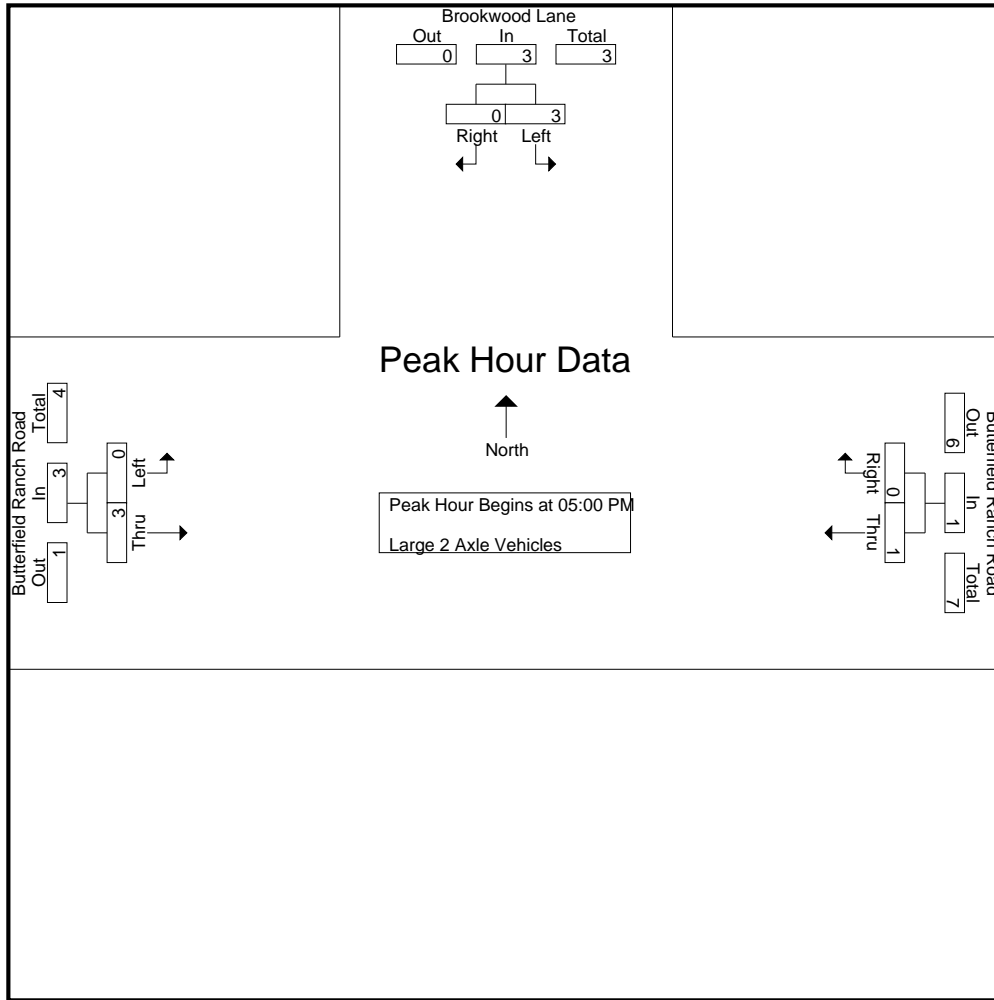
Groups Printed- Large 2 Axle Vehicles

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
04:00 PM	0	0	0	0	0	0	0	1	1	1
04:15 PM	0	0	0	0	0	0	0	1	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	1	0	0	0	0	0	0	1
Total	1	0	1	0	0	0	0	2	2	3
05:00 PM	1	0	1	1	0	1	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	1	1
05:30 PM	0	0	0	0	0	0	0	2	2	2
05:45 PM	2	0	2	0	0	0	0	0	0	2
Total	3	0	3	1	0	1	0	3	3	7
Grand Total	4	0	4	1	0	1	0	5	5	10
Apprch %	100	0		100	0		0	100		
Total %	40	0	40	10	0	10	0	50	50	

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	1	0	1	1	0	1	0	0	0	2
05:15 PM	0	0	0	0	0	0	0	1	1	1
05:30 PM	0	0	0	0	0	0	0	2	2	2
05:45 PM	2	0	2	0	0	0	0	0	0	2
Total Volume	3	0	3	1	0	1	0	3	3	7
% App. Total	100	0		100	0		0	100		
PHF	.375	.000	.375	.250	.000	.250	.000	.375	.375	.875

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
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Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	1	0	1	1	0	1	0	0	0
+15 mins.	0	0	0	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0	0	2	2
+45 mins.	2	0	2	0	0	0	0	0	0
Total Volume	3	0	3	1	0	1	0	3	3
% App. Total	100	0		100	0		0	100	
PHF	.375	.000	.375	.250	.000	.250	.000	.375	.375

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

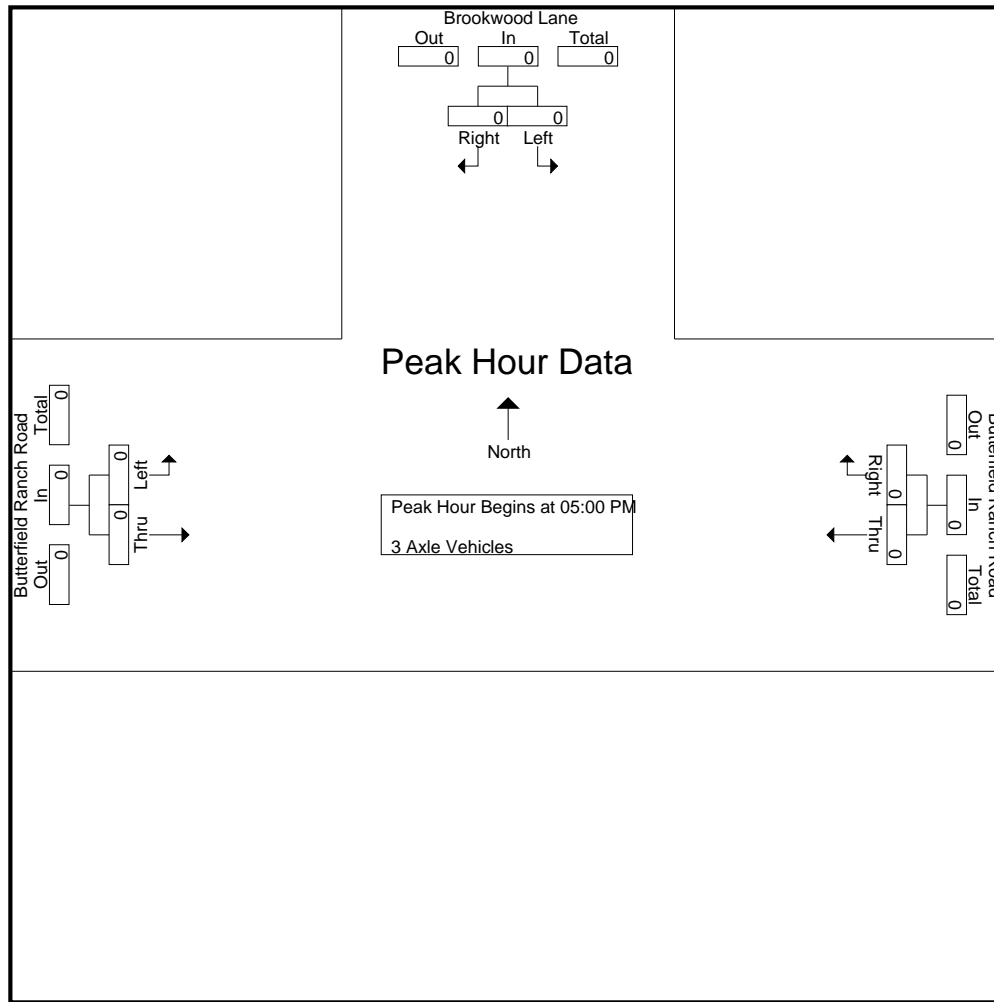
Groups Printed- 3 Axle Vehicles

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

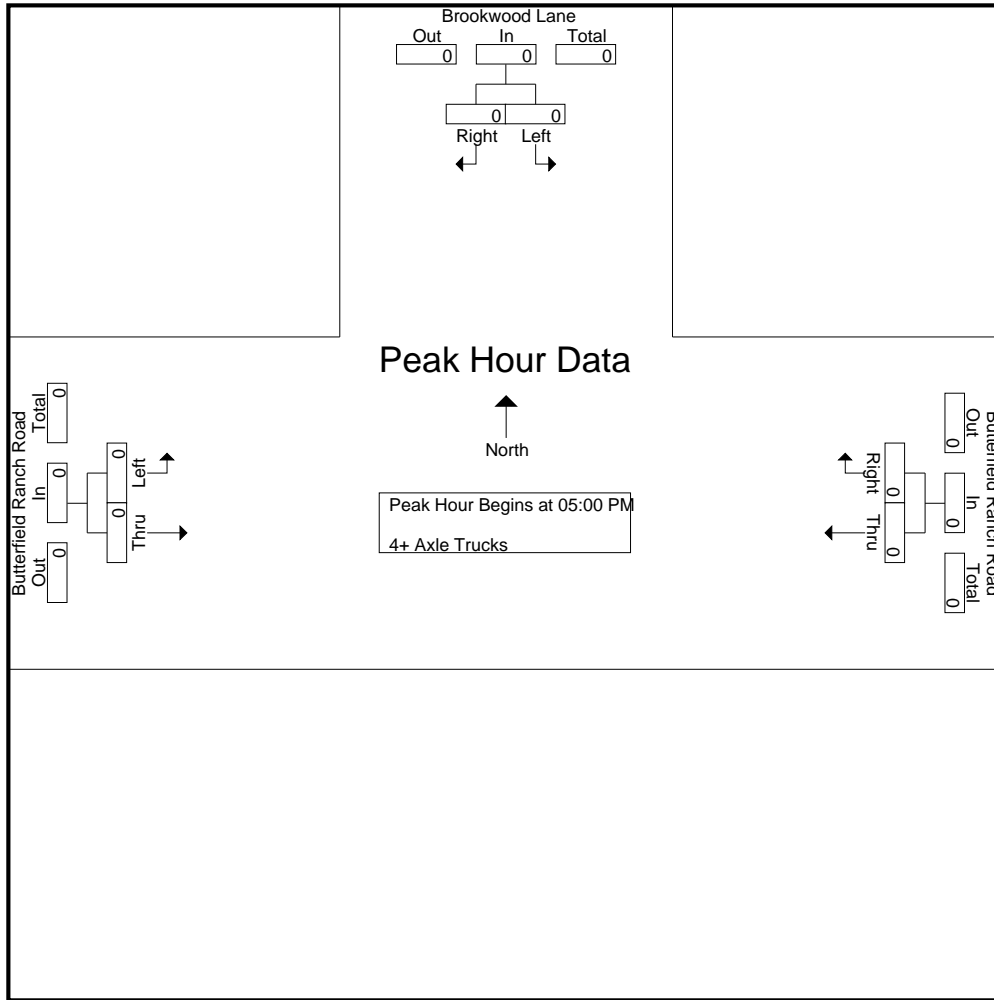
Groups Printed- 4+ Axle Trucks

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

Start Time	Brookwood Lane Southbound			Butterfield Ranch Road Westbound			Butterfield Ranch Road Eastbound			Int. Total
	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Brookwood Lane
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 03_CHH_Brook_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Location: Chino Hills
 N/S: Raleigh Ave/Twin Knolls Dr
 E/W: Butterfield Ranch Rd



Date: 11/19/2020
 Day Thursday

PEDESTRIANS

Time	North Leg Raleigh Avenue	East Leg Butterfield Ranch Rd	South Leg Twin Knolls Drive	West Leg Butterfield Ranch Rd	TOTAL
12:00 AM	0	0	0	0	0
12:15 AM	0	0	0	0	0
12:30 AM	0	0	0	0	0
12:45 AM	0	0	0	0	0
1:00 AM	0	0	0	0	0
1:15 AM	0	0	0	0	0
1:30 AM	0	0	0	0	0
1:45 AM	0	0	0	0	0
2:00 AM	0	0	0	0	0
2:15 AM	0	0	0	0	0
2:30 AM	0	0	0	0	0
2:45 AM	0	0	0	0	0
3:00 AM	0	0	0	0	0
3:15 AM	0	0	0	0	0
3:30 AM	0	0	0	0	0
3:45 AM	0	0	0	0	0
4:00 AM	0	0	0	0	0
4:15 AM	0	0	0	0	0
4:30 AM	0	0	0	0	0
4:45 AM	0	0	0	0	0
5:00 AM	0	0	0	0	0
5:15 AM	0	0	0	0	0
5:30 AM	0	0	0	0	0
5:45 AM	1	0	0	0	1
6:00 AM	2	0	3	0	5
6:15 AM	0	0	1	0	1
6:30 AM	1	0	0	0	1
6:45 AM	0	0	2	0	2
7:00 AM	3	0	0	0	3
7:15 AM	0	0	0	0	0
7:30 AM	2	1	2	0	5
7:45 AM	4	1	2	0	7
8:00 AM	0	1	2	0	3
8:15 AM	4	0	1	0	5
8:30 AM	0	0	5	0	5
8:45 AM	0	0	3	0	3
9:00 AM	5	0	2	1	8
9:15 AM	1	1	4	0	6
9:30 AM	3	0	1	0	4
9:45 AM	2	0	5	0	7
10:00 AM	3	0	3	0	6
10:15 AM	1	0	3	3	7
10:30 AM	0	0	3	0	3
10:45 AM	0	0	1	0	1
11:00 AM	0	0	0	0	0
11:15 AM	0	0	3	0	3
11:30 AM	0	0	1	0	1
11:45 AM	0	1	4	0	5
12:00 PM	0	0	2	0	2
12:15 PM	0	0	3	0	3
12:30 PM	1	0	2	0	3
12:45 PM	0	0	0	0	0
1:00 PM	0	0	0	0	0
1:15 PM	2	0	0	0	2
1:30 PM	1	0	0	0	1
1:45 PM	1	0	0	0	1
2:00 PM	1	0	0	0	1
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	1	0	0	0	1
3:00 PM	2	0	5	2	9
3:15 PM	0	0	1	0	1
3:30 PM	3	0	5	1	9
3:45 PM	4	0	0	0	4
4:00 PM	0	0	1	1	2
4:15 PM	2	1	1	0	4
4:30 PM	1	0	2	0	3
4:45 PM	3	0	1	1	4
5:00 PM	1	0	5	0	6
5:15 PM	0	0	1	0	1
5:30 PM	0	0	0	0	0
5:45 PM	1	0	2	0	3
6:00 PM	0	0	0	0	0
6:15 PM	0	0	0	0	0
6:30 PM	2	0	0	0	2
6:45 PM	0	0	0	0	0
7:00 PM	0	0	0	0	0
7:15 PM	0	0	0	0	0
7:30 PM	0	2	0	0	2
7:45 PM	0	0	0	0	0
8:00 PM	1	0	0	0	1
8:15 PM	0	0	2	0	2
8:30 PM	0	0	0	0	0
8:45 PM	0	0	1	0	1
9:00 PM	0	0	0	0	0
9:15 PM	0	0	0	0	0
9:30 PM	0	0	0	0	0
9:45 PM	0	0	0	0	0
10:00 PM	0	0	0	0	0
10:15 PM	0	0	0	0	0
10:30 PM	0	0	0	0	0
10:45 PM	0	0	0	0	0
11:00 PM	0	0	0	0	0
11:15 PM	0	0	0	0	0
11:30 PM	0	0	0	0	0
11:45 PM	0	0	0	0	0
TOTAL VOLUMES:	59	8	84	9	160

Location: Chino Hills
 N/S: Raleigh Ave/Twin Knolls Dr
 E/W: Butterfield Ranch Rd

Date: 11/19/2020
 Day: Thursday



BICYCLES

	Southbound Raleigh Avenue			Westbound Butterfield Ranch Rd			Northbound Twin Knolls Drive			Eastbound Butterfield Ranch Rd			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	1	0	0	0	0	0	1	0	2
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
9:45 AM	0	0	0	0	3	0	0	0	0	0	2	0	5
10:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
10:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
12:00 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
1:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	2
3:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	0	0	1	0	0	0	1	0	2
4:00 PM	0	0	0	0	3	0	0	0	0	0	1	0	4
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
4:45 PM	0	0	0	0	3	0	0	0	1	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	3	0	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	1	0	0	0	0	0	1	0	2
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	23	0	1	0	1	0	18	0	43

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
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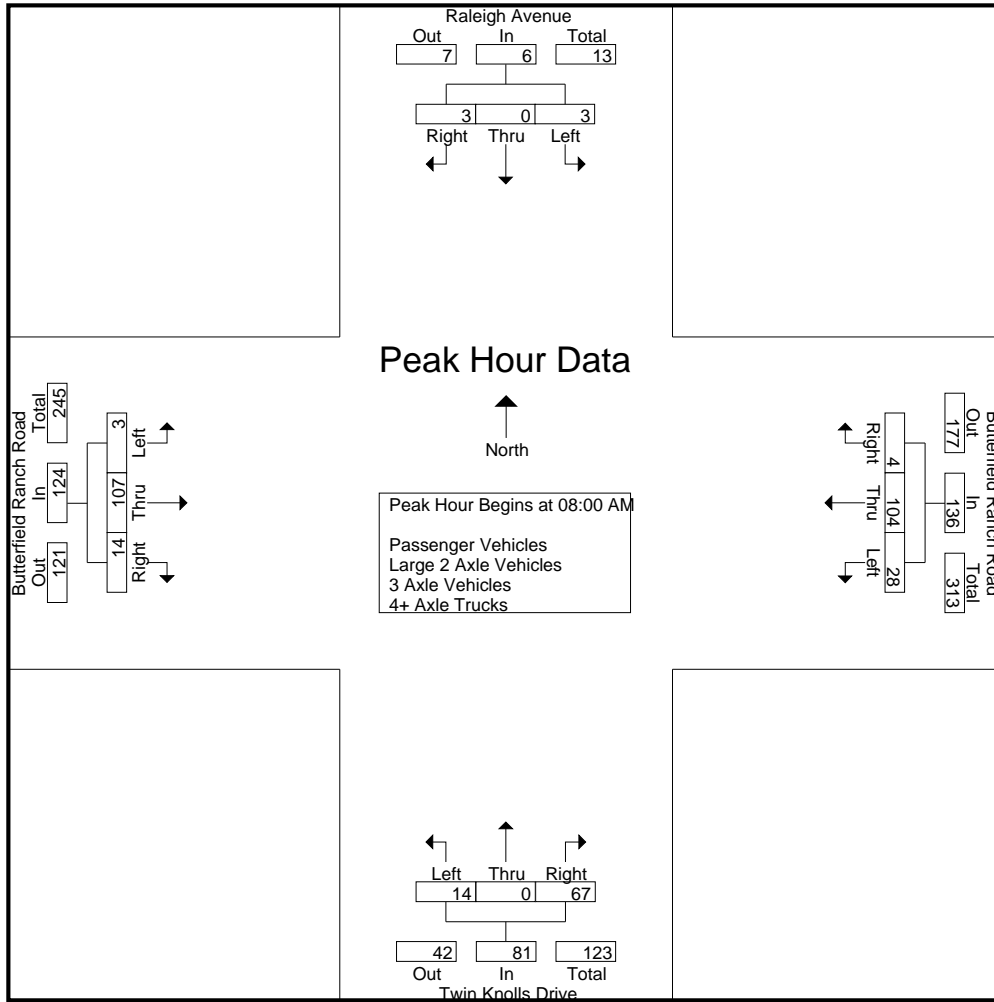
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	1	1	2	6	12	0	18	4	0	10	14	0	28	3	31	65
07:15 AM	0	0	1	1	2	10	0	12	0	0	14	14	0	32	0	32	59
07:30 AM	0	0	1	1	3	11	2	16	2	0	20	22	1	43	0	44	83
07:45 AM	2	0	2	4	10	23	0	33	4	0	15	19	1	36	1	38	94
Total	2	1	5	8	21	56	2	79	10	0	59	69	2	139	4	145	301
08:00 AM	0	0	0	0	7	23	0	30	2	0	17	19	0	25	5	30	79
08:15 AM	1	0	1	2	8	24	1	33	3	0	13	16	0	22	1	23	74
08:30 AM	1	0	0	1	9	22	1	32	3	0	18	21	2	31	6	39	93
08:45 AM	1	0	2	3	4	35	2	41	6	0	19	25	1	29	2	32	101
Total	3	0	3	6	28	104	4	136	14	0	67	81	3	107	14	124	347
Grand Total	5	1	8	14	49	160	6	215	24	0	126	150	5	246	18	269	648
Apprch %	35.7	7.1	57.1		22.8	74.4	2.8		16	0	84		1.9	91.4	6.7		
Total %	0.8	0.2	1.2	2.2	7.6	24.7	0.9	33.2	3.7	0	19.4	23.1	0.8	38	2.8	41.5	
Passenger Vehicles	5	1	8	14	48	156	6	210	24	0	124	148	5	244	17	266	638
% Passenger Vehicles	100	100	100	100	98	97.5	100	97.7	100	0	98.4	98.7	100	99.2	94.4	98.9	98.5
Large 2 Axle Vehicles	0	0	0	0	1	3	0	4	0	0	2	2	0	2	1	3	9
% Large 2 Axle Vehicles	0	0	0	0	2	1.9	0	1.9	0	0	1.6	1.3	0	0.8	5.6	1.1	1.4
3 Axle Vehicles	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0.6	0	0.5	0	0	0	0	0	0	0	0	0.2
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	7	23	0	30	2	0	17	19	0	25	5	30	79
08:15 AM	1	0	1	2	8	24	1	33	3	0	13	16	0	22	1	23	74
08:30 AM	1	0	0	1	9	22	1	32	3	0	18	21	2	31	6	39	93
08:45 AM	1	0	2	3	4	35	2	41	6	0	19	25	1	29	2	32	101
Total Volume	3	0	3	6	28	104	4	136	14	0	67	81	3	107	14	124	347
% App. Total	50	0	50		20.6	76.5	2.9		17.3	0	82.7		2.4	86.3	11.3		
PHF	.750	.000	.375	.500	.778	.743	.500	.829	.583	.000	.882	.810	.375	.863	.583	.795	.859

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	1	1	2	7	23	0	30	2	0	17	19	0	28	3	31
+15 mins.	0	0	1	1	8	24	1	33	3	0	13	16	0	32	0	32
+30 mins.	0	0	1	1	9	22	1	32	3	0	18	21	1	43	0	44
+45 mins.	2	0	2	4	4	35	2	41	6	0	19	25	1	36	1	38
Total Volume	2	1	5	8	28	104	4	136	14	0	67	81	2	139	4	145
% App. Total	25	12.5	62.5		20.6	76.5	2.9		17.3	0	82.7		1.4	95.9	2.8	
PHF	.250	.250	.625	.500	.778	.743	.500	.829	.583	.000	.882	.810	.500	.808	.333	.824

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

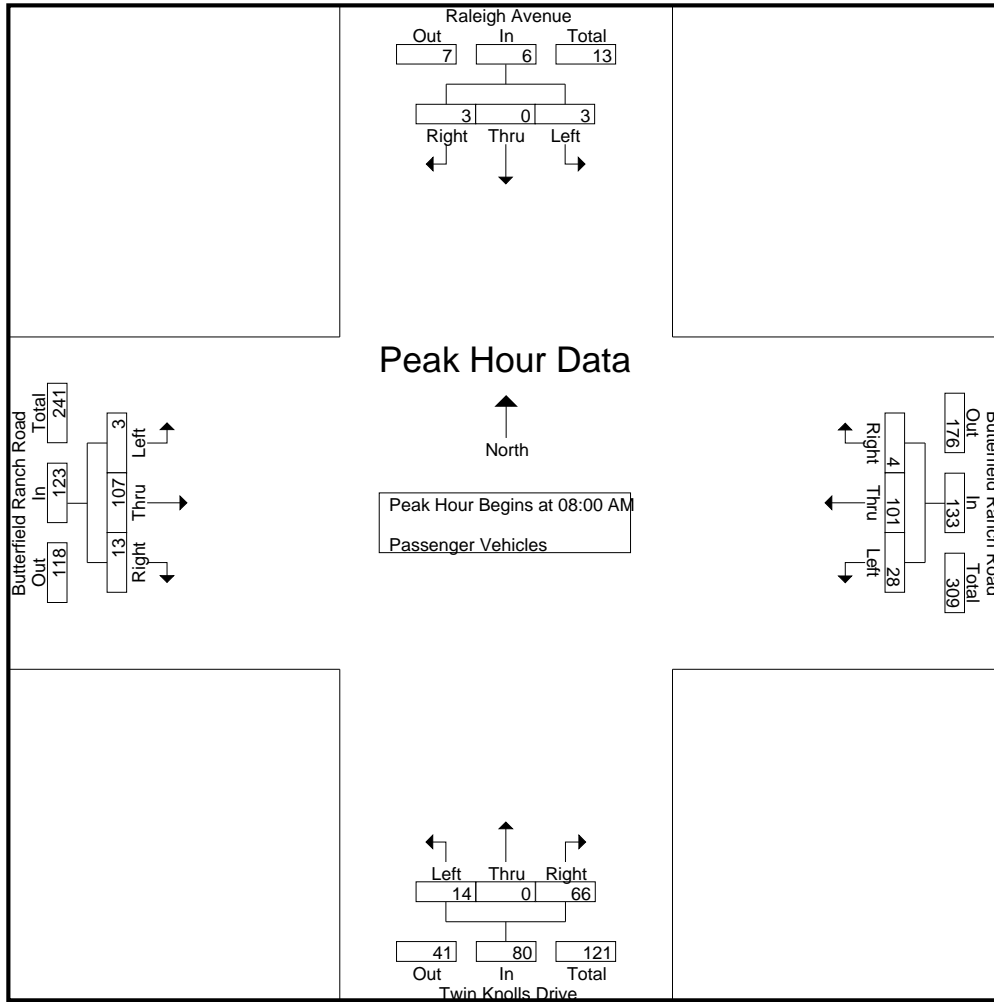
Groups Printed- Passenger Vehicles

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	1	1	2	5	12	0	17	4	0	9	13	0	27	3	30	62
07:15 AM	0	0	1	1	2	10	0	12	0	0	14	14	0	32	0	32	59
07:30 AM	0	0	1	1	3	11	2	16	2	0	20	22	1	43	0	44	83
07:45 AM	2	0	2	4	10	22	0	32	4	0	15	19	1	35	1	37	92
Total	2	1	5	8	20	55	2	77	10	0	58	68	2	137	4	143	296
08:00 AM	0	0	0	0	7	23	0	30	2	0	17	19	0	25	4	29	78
08:15 AM	1	0	1	2	8	23	1	32	3	0	12	15	0	22	1	23	72
08:30 AM	1	0	0	1	9	21	1	31	3	0	18	21	2	31	6	39	92
08:45 AM	1	0	2	3	4	34	2	40	6	0	19	25	1	29	2	32	100
Total	3	0	3	6	28	101	4	133	14	0	66	80	3	107	13	123	342
Grand Total	5	1	8	14	48	156	6	210	24	0	124	148	5	244	17	266	638
Apprch %	35.7	7.1	57.1		22.9	74.3	2.9		16.2	0	83.8		1.9	91.7	6.4		
Total %	0.8	0.2	1.3	2.2	7.5	24.5	0.9	32.9	3.8	0	19.4	23.2	0.8	38.2	2.7	41.7	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	7	23	0	30	2	0	17	19	0	25	4	29	78
08:15 AM	1	0	1	2	8	23	1	32	3	0	12	15	0	22	1	23	72
08:30 AM	1	0	0	1	9	21	1	31	3	0	18	21	2	31	6	39	92
08:45 AM	1	0	2	3	4	34	2	40	6	0	19	25	1	29	2	32	100
Total Volume	3	0	3	6	28	101	4	133	14	0	66	80	3	107	13	123	342
% App. Total	50	0	50		21.1	75.9	3		17.5	0	82.5		2.4	87	10.6		
PHF	.750	.000	.375	.500	.778	.743	.500	.831	.583	.000	.868	.800	.375	.863	.542	.788	.855

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
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Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	7	23	0	30	2	0	17	19	0	25	4	29
+15 mins.	1	0	1	2	8	23	1	32	3	0	12	15	0	22	1	23
+30 mins.	1	0	0	1	9	21	1	31	3	0	18	21	2	31	6	39
+45 mins.	1	0	2	3	4	34	2	40	6	0	19	25	1	29	2	32
Total Volume	3	0	3	6	28	101	4	133	14	0	66	80	3	107	13	123
% App. Total	50	0	50		21.1	75.9	3		17.5	0	82.5		2.4	87	10.6	
PHF	.750	.000	.375	.500	.778	.743	.500	.831	.583	.000	.868	.800	.375	.863	.542	.788

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

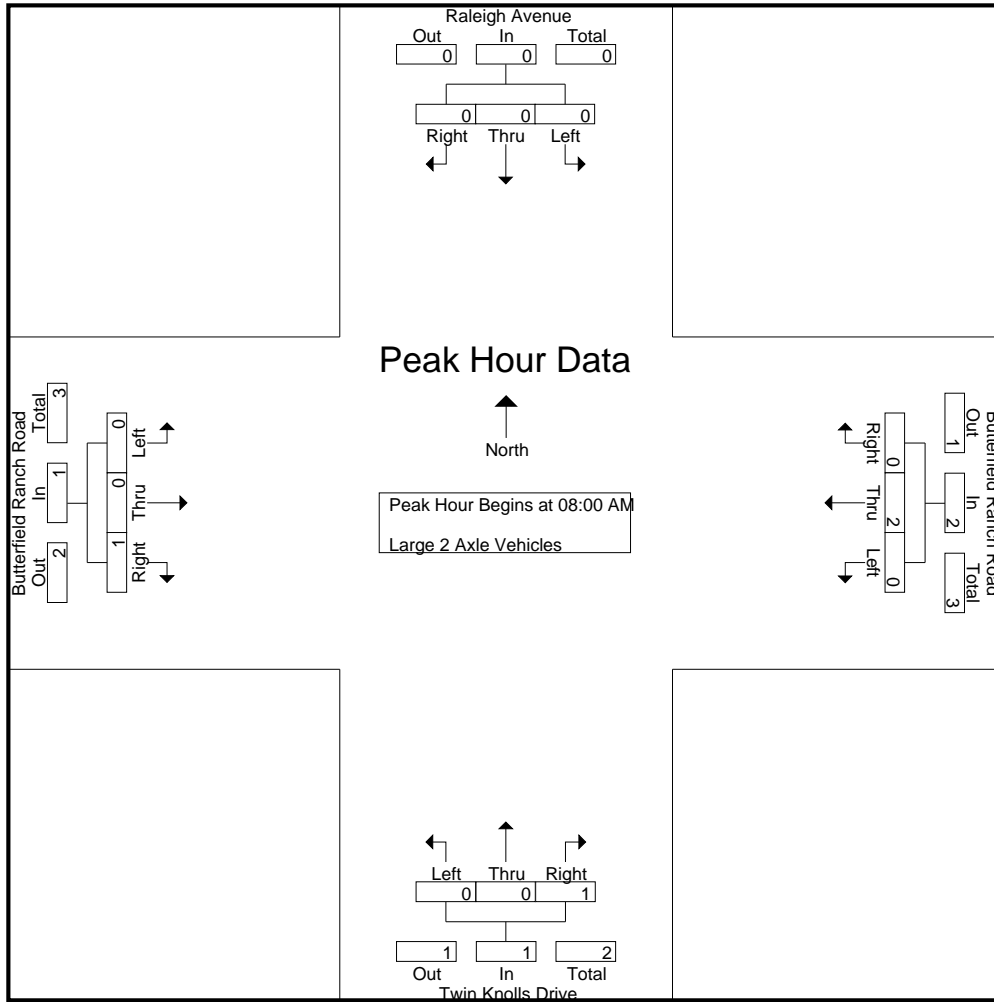
Groups Printed- Large 2 Axle Vehicles

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	1	0	0	1	0	0	1	1	0	1	0	1	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Total	0	0	0	0	1	1	0	2	0	0	1	1	0	2	0	2	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:15 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	0	0	1	1	0	0	1	1	4
Grand Total	0	0	0	0	1	3	0	4	0	0	2	2	0	2	1	3	9
Apprch %	0	0	0		25	75	0		0	0	100		0	66.7	33.3		
Total %	0	0	0		11.1	33.3	0	44.4	0	0	22.2	22.2	0	22.2	11.1	33.3	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:15 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	2	0	2	0	0	1	1	0	0	1	1	4
% App. Total	0	0	0		0	100	0		0	0	100		0	0	100		
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.250	.250	.000	.000	.250	.250	.500

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
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Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
+15 mins.	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0
+30 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	2	0	2	0	0	1	1	0	0	1	1
% App. Total	0	0	0	0	0	100	0	0	0	0	100	0	0	0	100	0
PHF	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.250	.250	.000	.000	.250	.250

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
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 Page No : 1

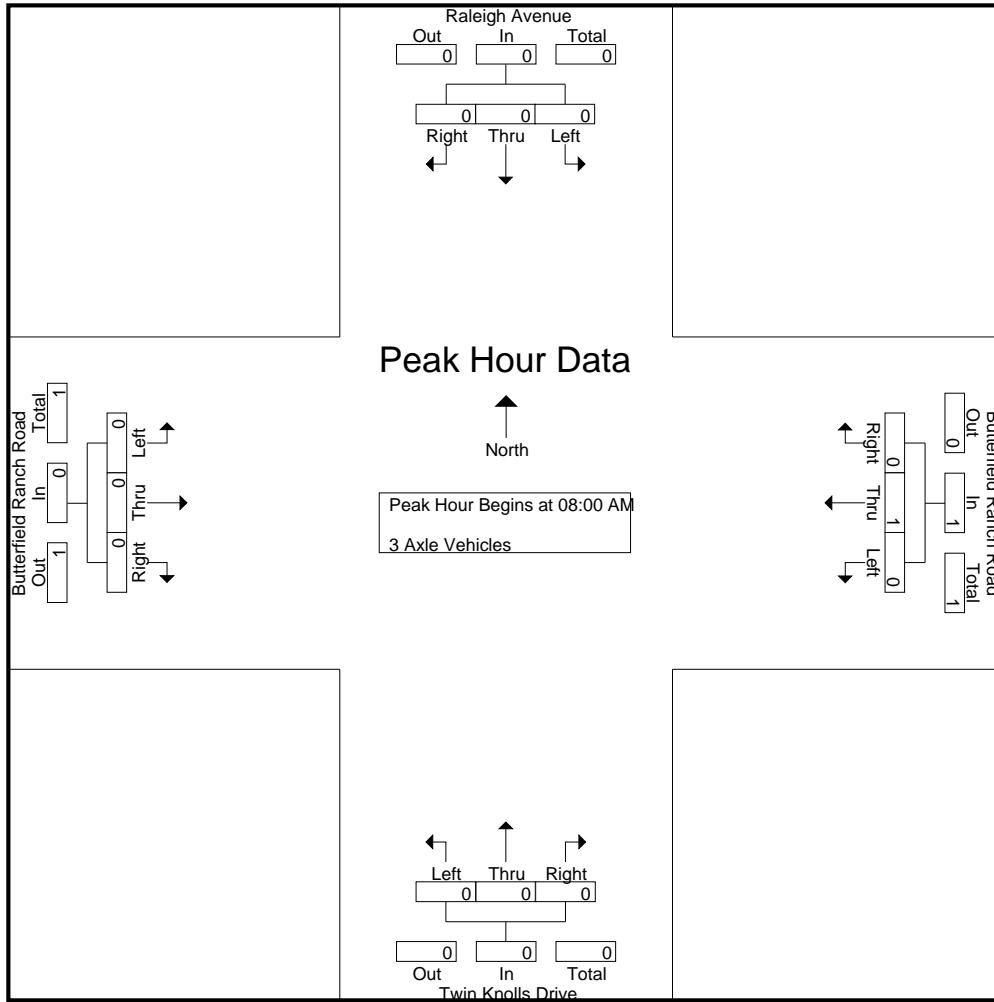
Groups Printed- 3 Axle Vehicles

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		0	100	0		0	0	0		0	0	0		
Total %	0	0	0		0	100	0	100	0	0	0		0	0	0		

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

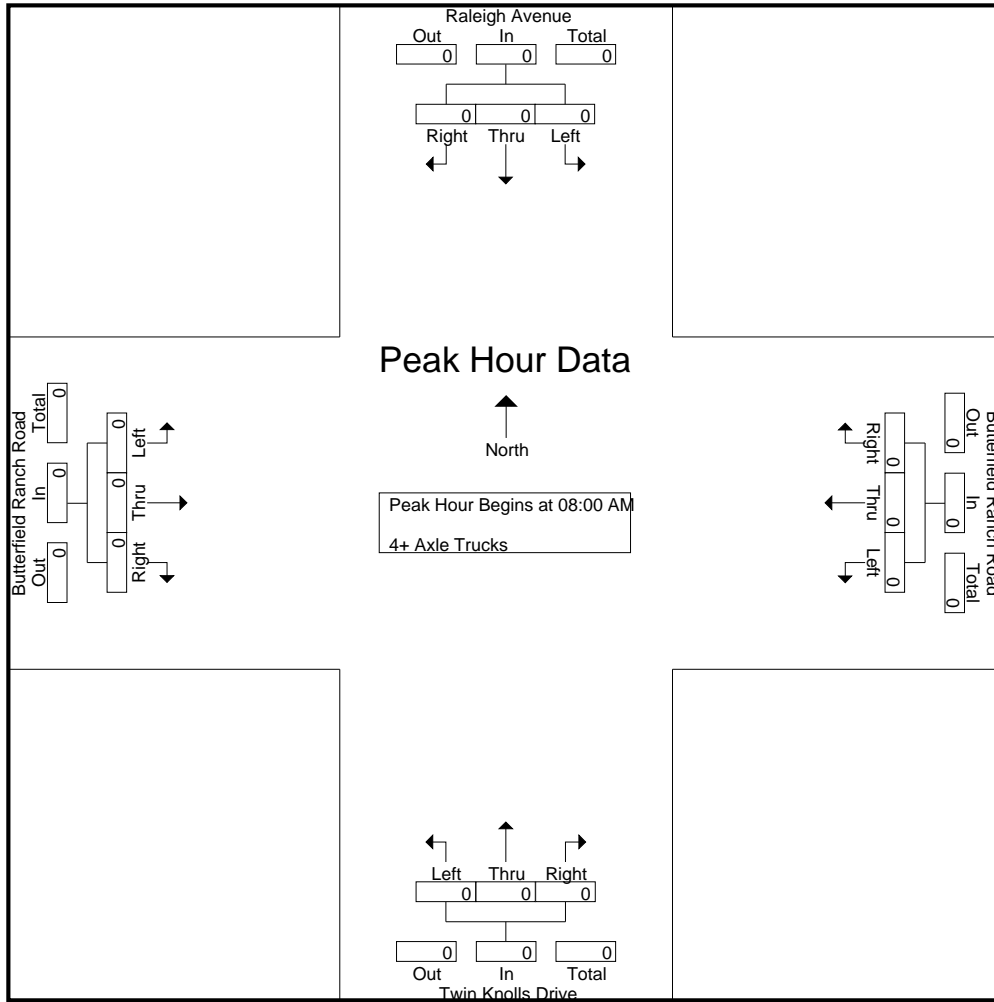
Groups Printed- 4+ Axle Trucks

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

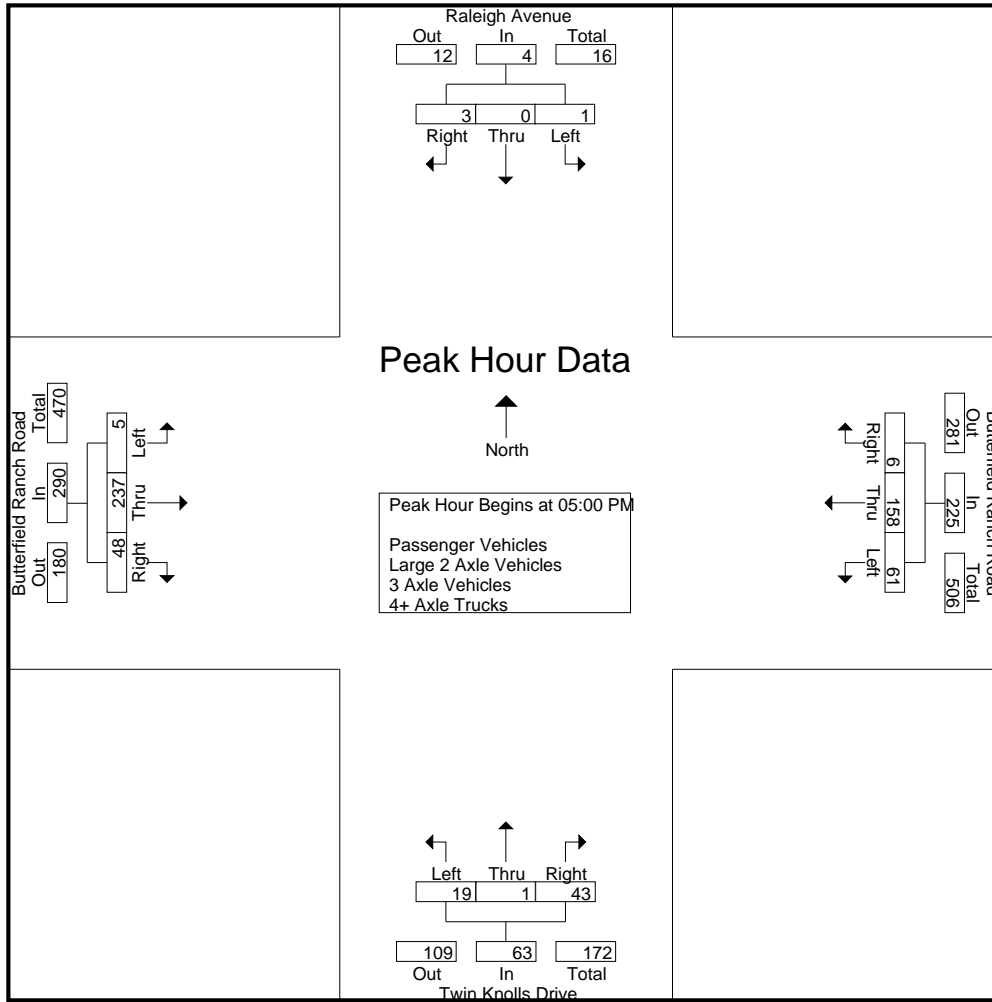
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	1	0	0	1	16	38	0	54	5	0	6	11	0	50	10	60	126
04:15 PM	0	1	2	3	14	39	3	56	5	0	15	20	3	67	8	78	157
04:30 PM	0	0	1	1	10	39	1	50	3	0	8	11	4	46	6	56	118
04:45 PM	0	0	2	2	14	42	4	60	5	0	8	13	0	44	3	47	122
Total	1	1	5	7	54	158	8	220	18	0	37	55	7	207	27	241	523
05:00 PM	1	0	2	3	23	38	2	63	4	0	12	16	1	53	7	61	143
05:15 PM	0	0	0	0	13	46	2	61	1	0	11	12	4	71	17	92	165
05:30 PM	0	0	1	1	11	41	1	53	6	0	12	18	0	58	13	71	143
05:45 PM	0	0	0	0	14	33	1	48	8	1	8	17	0	55	11	66	131
Total	1	0	3	4	61	158	6	225	19	1	43	63	5	237	48	290	582
Grand Total	2	1	8	11	115	316	14	445	37	1	80	118	12	444	75	531	1105
Apprch %	18.2	9.1	72.7		25.8	71	3.1		31.4	0.8	67.8		2.3	83.6	14.1		
Total %	0.2	0.1	0.7	1	10.4	28.6	1.3	40.3	3.3	0.1	7.2	10.7	1.1	40.2	6.8	48.1	
Passenger Vehicles	2	1	8	11	115	315	14	444	37	1	80	118	12	438	75	525	1098
% Passenger Vehicles	100	100	100	100	100	99.7	100	99.8	100	100	100	100	100	98.6	100	98.9	99.4
Large 2 Axle Vehicles	0	0	0	0	0	1	0	1	0	0	0	0	0	6	0	6	7
% Large 2 Axle Vehicles	0	0	0	0	0	0.3	0	0.2	0	0	0	0	0	1.4	0	1.1	0.6
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	0	2	3	23	38	2	63	4	0	12	16	1	53	7	61	143
05:15 PM	0	0	0	0	13	46	2	61	1	0	11	12	4	71	17	92	165
05:30 PM	0	0	1	1	11	41	1	53	6	0	12	18	0	58	13	71	143
05:45 PM	0	0	0	0	14	33	1	48	8	1	8	17	0	55	11	66	131
Total Volume	1	0	3	4	61	158	6	225	19	1	43	63	5	237	48	290	582
% App. Total	25	0	75		27.1	70.2	2.7		30.2	1.6	68.3		1.7	81.7	16.6		
PHF	.250	.000	.375	.333	.663	.859	.750	.893	.594	.250	.896	.875	.313	.835	.706	.788	.882

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	0	1	2	3	14	42	4	60	4	0	12	16	1	53	7	61
+15 mins.	0	0	1	1	23	38	2	63	1	0	11	12	4	71	17	92
+30 mins.	0	0	2	2	13	46	2	61	6	0	12	18	0	58	13	71
+45 mins.	1	0	2	3	11	41	1	53	8	1	8	17	0	55	11	66
Total Volume	1	1	7	9	61	167	9	237	19	1	43	63	5	237	48	290
% App. Total	11.1	11.1	77.8		25.7	70.5	3.8		30.2	1.6	68.3		1.7	81.7	16.6	
PHF	.250	.250	.875	.750	.663	.908	.563	.940	.594	.250	.896	.875	.313	.835	.706	.788

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

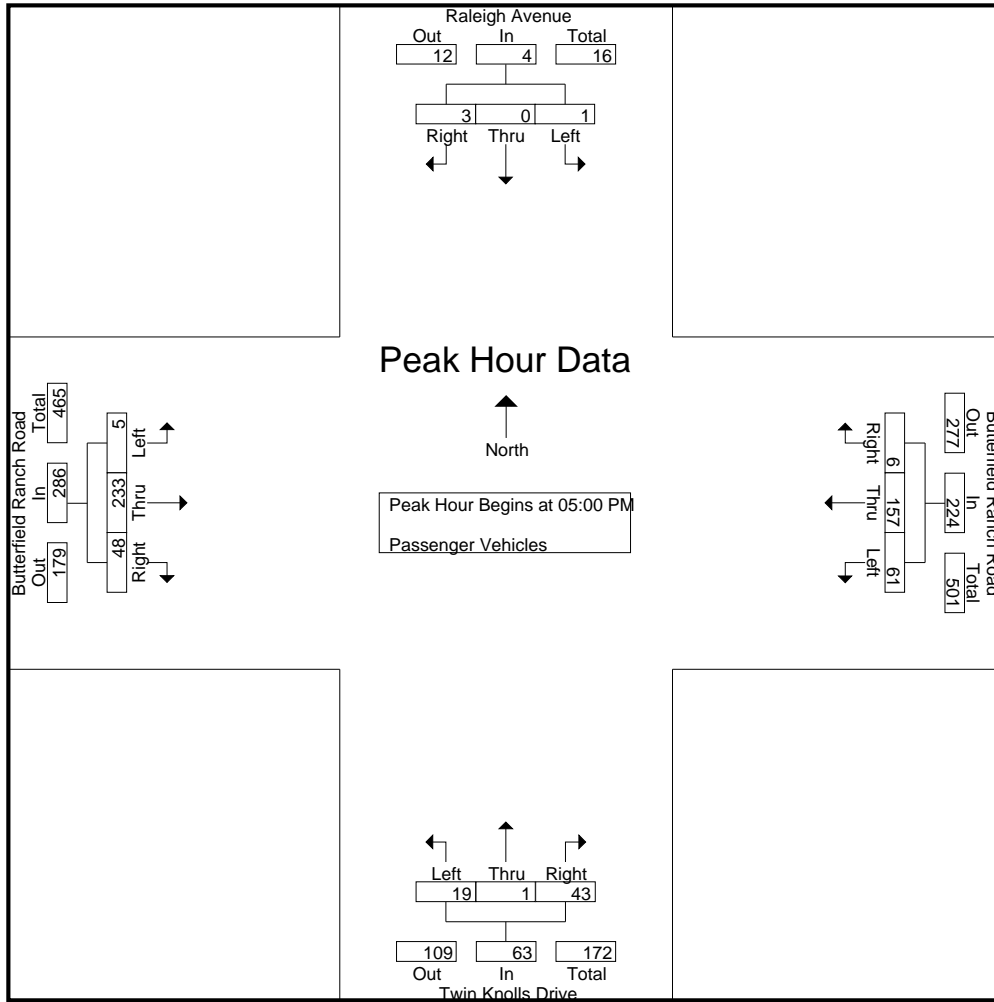
Groups Printed- Passenger Vehicles

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	1	0	0	1	16	38	0	54	5	0	6	11	0	49	10	59	125
04:15 PM	0	1	2	3	14	39	3	56	5	0	15	20	3	66	8	77	156
04:30 PM	0	0	1	1	10	39	1	50	3	0	8	11	4	46	6	56	118
04:45 PM	0	0	2	2	14	42	4	60	5	0	8	13	0	44	3	47	122
Total	1	1	5	7	54	158	8	220	18	0	37	55	7	205	27	239	521
05:00 PM	1	0	2	3	23	37	2	62	4	0	12	16	1	53	7	61	142
05:15 PM	0	0	0	0	13	46	2	61	1	0	11	12	4	69	17	90	163
05:30 PM	0	0	1	1	11	41	1	53	6	0	12	18	0	56	13	69	141
05:45 PM	0	0	0	0	14	33	1	48	8	1	8	17	0	55	11	66	131
Total	1	0	3	4	61	157	6	224	19	1	43	63	5	233	48	286	577
Grand Total	2	1	8	11	115	315	14	444	37	1	80	118	12	438	75	525	1098
Apprch %	18.2	9.1	72.7		25.9	70.9	3.2		31.4	0.8	67.8		2.3	83.4	14.3		
Total %	0.2	0.1	0.7	1	10.5	28.7	1.3	40.4	3.4	0.1	7.3	10.7	1.1	39.9	6.8	47.8	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	0	2	3	23	37	2	62	4	0	12	16	1	53	7	61	142
05:15 PM	0	0	0	0	13	46	2	61	1	0	11	12	4	69	17	90	163
05:30 PM	0	0	1	1	11	41	1	53	6	0	12	18	0	56	13	69	141
05:45 PM	0	0	0	0	14	33	1	48	8	1	8	17	0	55	11	66	131
Total Volume	1	0	3	4	61	157	6	224	19	1	43	63	5	233	48	286	577
% App. Total	25	0	75		27.2	70.1	2.7		30.2	1.6	68.3		1.7	81.5	16.8		
PHF	.250	.000	.375	.333	.663	.853	.750	.903	.594	.250	.896	.875	.313	.844	.706	.794	.885

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM							
+0 mins.	1	0	2	3	23	37	2	62	4	0	12	16	1	53	7	61
+15 mins.	0	0	0	0	13	46	2	61	1	0	11	12	4	69	17	90
+30 mins.	0	0	1	1	11	41	1	53	6	0	12	18	0	56	13	69
+45 mins.	0	0	0	0	14	33	1	48	8	1	8	17	0	55	11	66
Total Volume	1	0	3	4	61	157	6	224	19	1	43	63	5	233	48	286
% App. Total	25	0	75		27.2	70.1	2.7		30.2	1.6	68.3		1.7	81.5	16.8	
PHF	.250	.000	.375	.333	.663	.853	.750	.903	.594	.250	.896	.875	.313	.844	.706	.794

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

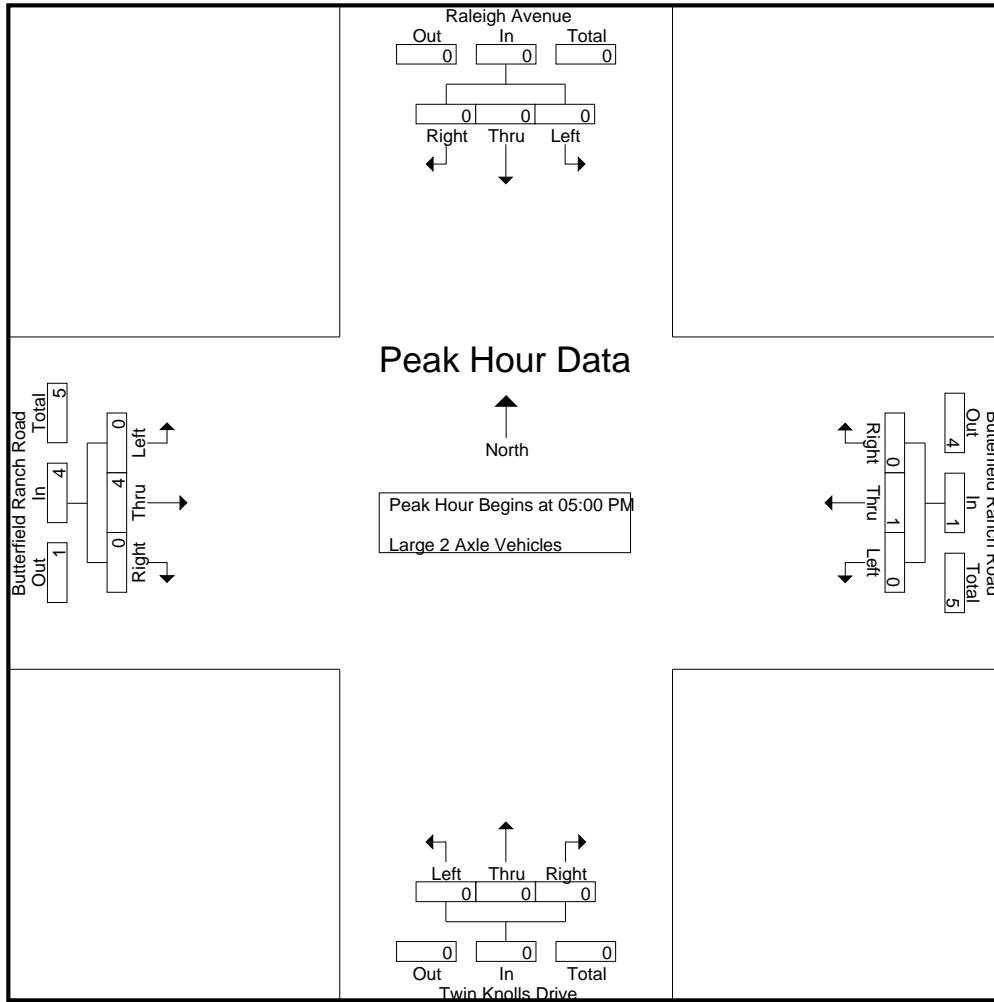
Groups Printed- Large 2 Axle Vehicles

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	4	0	4	5
Grand Total	0	0	0	0	0	1	0	1	0	0	0	0	0	6	0	6	7
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0		0	14.3	0	14.3	0	0	0		0	85.7	0	85.7	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	4	0	4	5
% App. Total	0	0	0		0	100	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.625

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	4	0	4
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

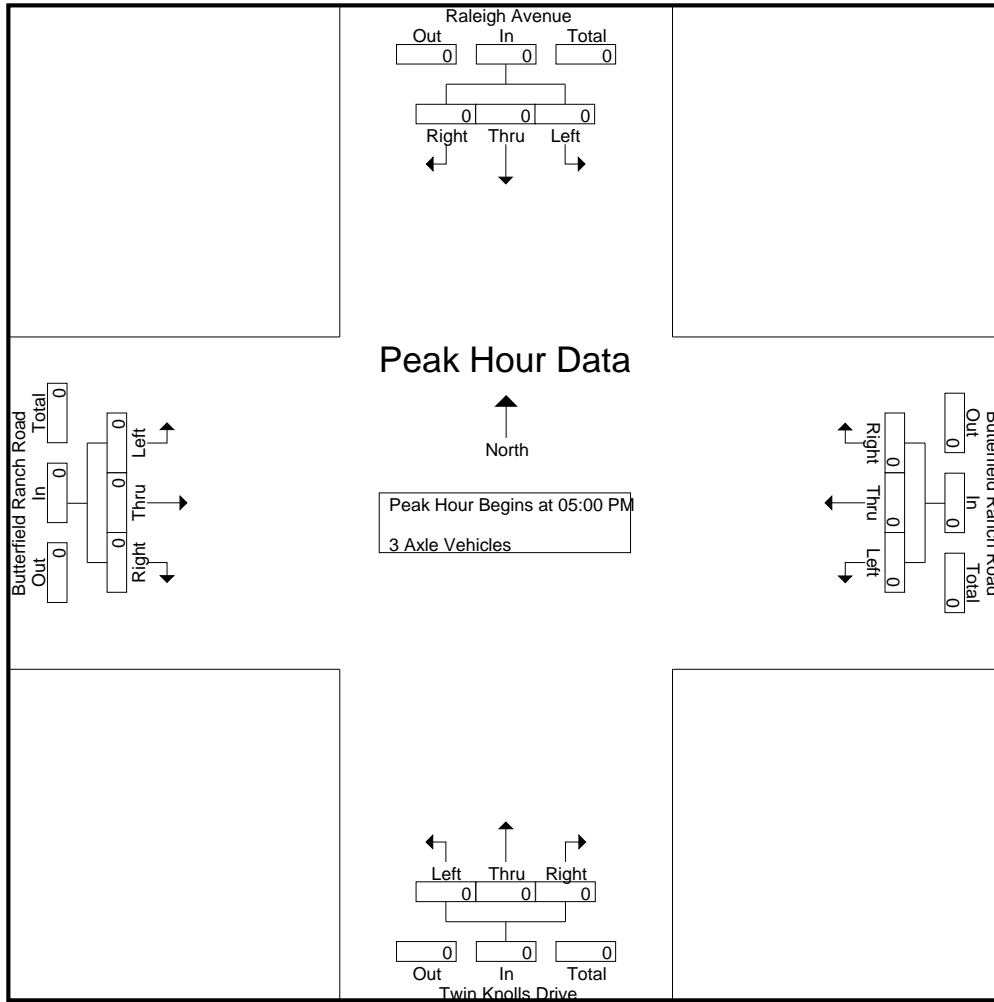
Groups Printed- 3 Axle Vehicles

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

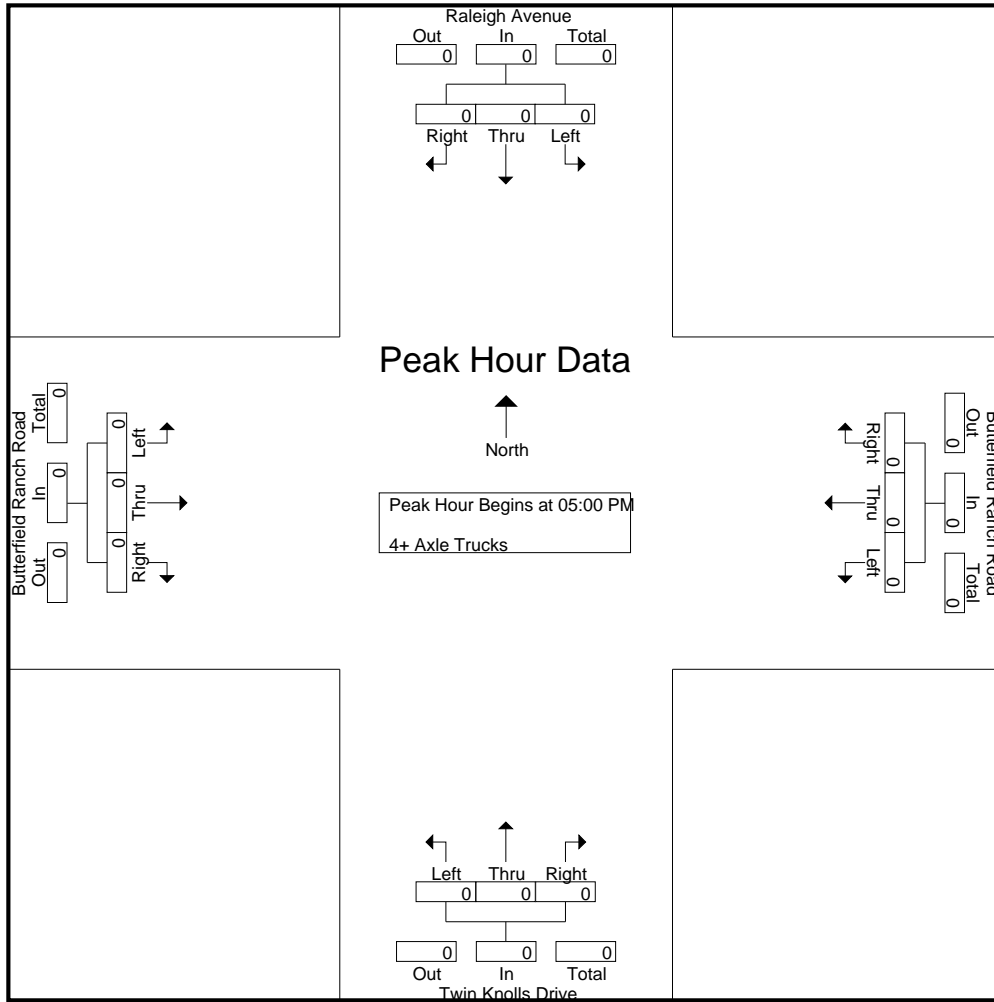
Groups Printed- 4+ Axle Trucks

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Raleigh Avenue Southbound				Butterfield Ranch Road Westbound				Twin Knolls Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Raleigh Avenue/Twin Knolls Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 04_CHH_Twin_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

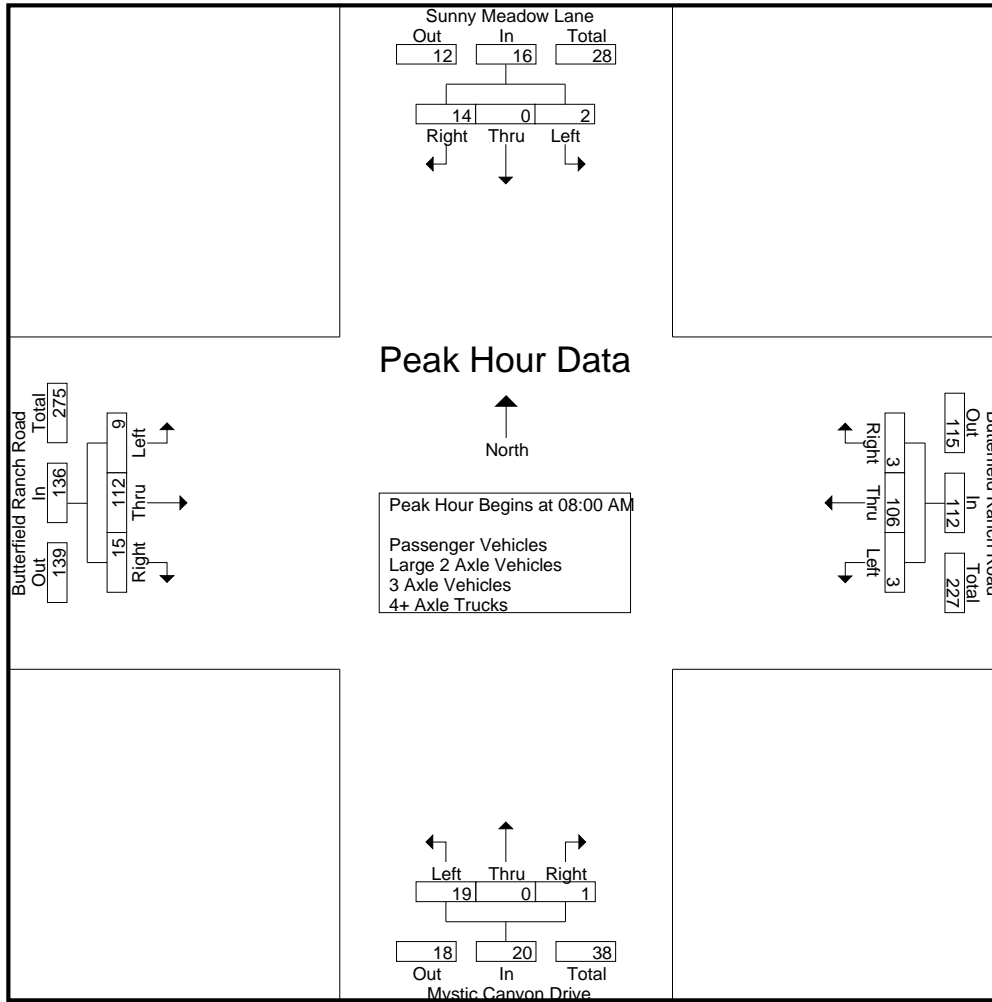
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	2	0	3	5	1	18	1	20	5	0	1	6	1	27	0	28	59
07:15 AM	1	0	2	3	0	13	0	13	3	0	0	3	0	25	2	27	46
07:30 AM	1	0	4	5	1	11	0	12	4	0	1	5	1	30	5	36	58
07:45 AM	1	0	4	5	0	27	0	27	8	0	6	14	2	26	0	28	74
Total	5	0	13	18	2	69	1	72	20	0	8	28	4	108	7	119	237
08:00 AM	1	0	4	5	0	20	1	21	3	0	0	3	2	28	3	33	62
08:15 AM	0	0	3	3	0	24	1	25	7	0	0	7	2	20	3	25	60
08:30 AM	1	0	4	5	0	23	0	23	4	0	1	5	4	37	4	45	78
08:45 AM	0	0	3	3	3	39	1	43	5	0	0	5	1	27	5	33	84
Total	2	0	14	16	3	106	3	112	19	0	1	20	9	112	15	136	284
Grand Total	7	0	27	34	5	175	4	184	39	0	9	48	13	220	22	255	521
Apprch %	20.6	0	79.4		2.7	95.1	2.2		81.2	0	18.8		5.1	86.3	8.6		
Total %	1.3	0	5.2	6.5	1	33.6	0.8	35.3	7.5	0	1.7	9.2	2.5	42.2	4.2	48.9	
Passenger Vehicles	7	0	27	34	5	170	4	179	39	0	7	46	13	218	21	252	511
% Passenger Vehicles	100	0	100	100	100	97.1	100	97.3	100	0	77.8	95.8	100	99.1	95.5	98.8	98.1
Large 2 Axle Vehicles	0	0	0	0	0	4	0	4	0	0	2	2	0	2	1	3	9
% Large 2 Axle Vehicles	0	0	0	0	0	2.3	0	2.2	0	0	22.2	4.2	0	0.9	4.5	1.2	1.7
3 Axle Vehicles	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0.6	0	0.5	0	0	0	0	0	0	0	0	0.2
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	0	4	5	0	20	1	21	3	0	0	3	2	28	3	33	62
08:15 AM	0	0	3	3	0	24	1	25	7	0	0	7	2	20	3	25	60
08:30 AM	1	0	4	5	0	23	0	23	4	0	1	5	4	37	4	45	78
08:45 AM	0	0	3	3	3	39	1	43	5	0	0	5	1	27	5	33	84
Total Volume	2	0	14	16	3	106	3	112	19	0	1	20	9	112	15	136	284
% App. Total	12.5	0	87.5		2.7	94.6	2.7		95	0	5		6.6	82.4	11		
PHF	.500	.000	.875	.800	.250	.679	.750	.651	.679	.000	.250	.714	.563	.757	.750	.756	.845

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				08:00 AM				07:30 AM				08:00 AM			
+0 mins.	2	0	3	5	0	20	1	21	4	0	1	5	2	28	3	33
+15 mins.	1	0	2	3	0	24	1	25	8	0	6	14	2	20	3	25
+30 mins.	1	0	4	5	0	23	0	23	3	0	0	3	4	37	4	45
+45 mins.	1	0	4	5	3	39	1	43	7	0	0	7	1	27	5	33
Total Volume	5	0	13	18	3	106	3	112	22	0	7	29	9	112	15	136
% App. Total	27.8	0	72.2		2.7	94.6	2.7		75.9	0	24.1		6.6	82.4	11	
PHF	.625	.000	.813	.900	.250	.679	.750	.651	.688	.000	.292	.518	.563	.757	.750	.756

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

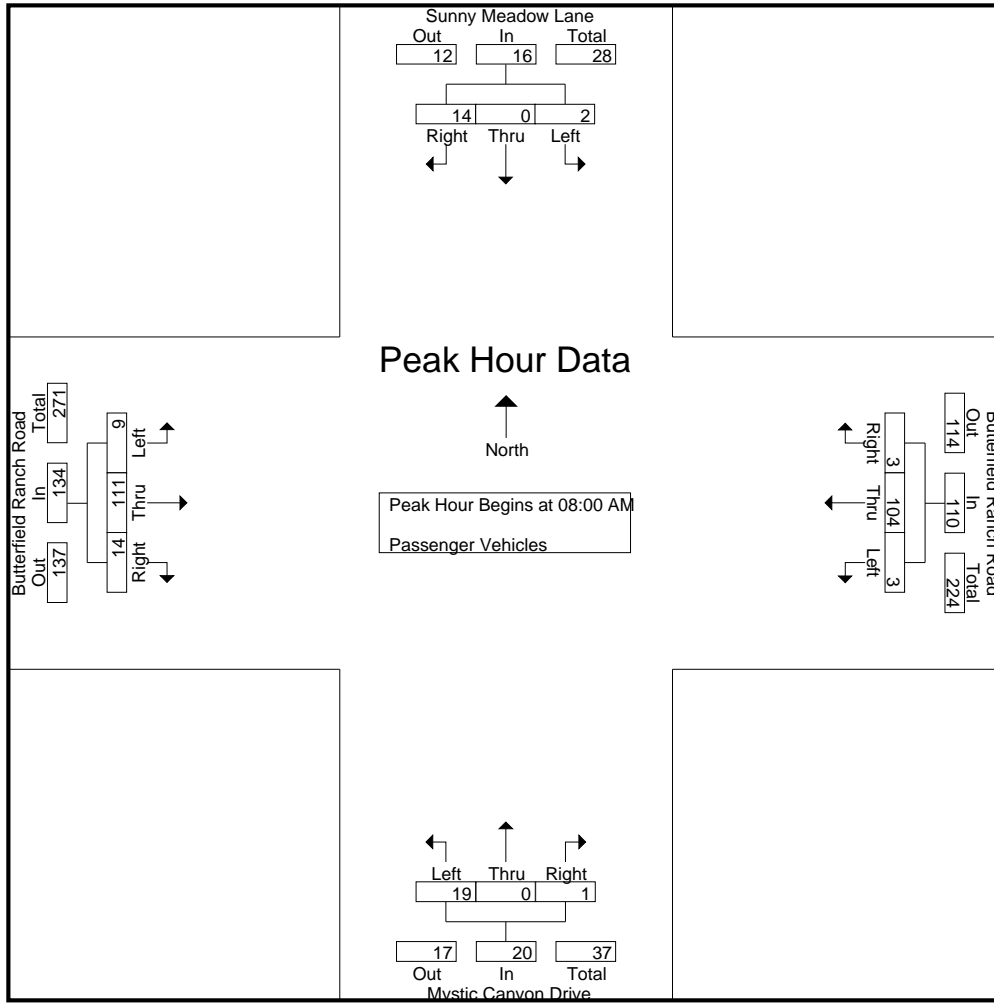
Groups Printed- Passenger Vehicles

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	2	0	3	5	1	17	1	19	5	0	0	5	1	26	0	27	56
07:15 AM	1	0	2	3	0	13	0	13	3	0	0	3	0	25	2	27	46
07:30 AM	1	0	4	5	1	11	0	12	4	0	0	4	1	30	5	36	57
07:45 AM	1	0	4	5	0	25	0	25	8	0	6	14	2	26	0	28	72
Total	5	0	13	18	2	66	1	69	20	0	6	26	4	107	7	118	231
08:00 AM	1	0	4	5	0	20	1	21	3	0	0	3	2	27	3	32	61
08:15 AM	0	0	3	3	0	23	1	24	7	0	0	7	2	20	2	24	58
08:30 AM	1	0	4	5	0	23	0	23	4	0	1	5	4	37	4	45	78
08:45 AM	0	0	3	3	3	38	1	42	5	0	0	5	1	27	5	33	83
Total	2	0	14	16	3	104	3	110	19	0	1	20	9	111	14	134	280
Grand Total	7	0	27	34	5	170	4	179	39	0	7	46	13	218	21	252	511
Apprch %	20.6	0	79.4		2.8	95	2.2		84.8	0	15.2		5.2	86.5	8.3		
Total %	1.4	0	5.3	6.7	1	33.3	0.8	35	7.6	0	1.4	9	2.5	42.7	4.1	49.3	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	1	0	4	5	0	20	1	21	3	0	0	3	2	27	3	32	61
08:15 AM	0	0	3	3	0	23	1	24	7	0	0	7	2	20	2	24	58
08:30 AM	1	0	4	5	0	23	0	23	4	0	1	5	4	37	4	45	78
08:45 AM	0	0	3	3	3	38	1	42	5	0	0	5	1	27	5	33	83
Total Volume	2	0	14	16	3	104	3	110	19	0	1	20	9	111	14	134	280
% App. Total	12.5	0	87.5		2.7	94.5	2.7		95	0	5		6.7	82.8	10.4		
PHF	.500	.000	.875	.800	.250	.684	.750	.655	.679	.000	.250	.714	.563	.750	.700	.744	.843

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	1	0	4	5	0	20	1	21	3	0	0	3	2	27	3	32
+15 mins.	0	0	3	3	0	23	1	24	7	0	0	7	2	20	2	24
+30 mins.	1	0	4	5	0	23	0	23	4	0	1	5	4	37	4	45
+45 mins.	0	0	3	3	3	38	1	42	5	0	0	5	1	27	5	33
Total Volume	2	0	14	16	3	104	3	110	19	0	1	20	9	111	14	134
% App. Total	12.5	0	87.5		2.7	94.5	2.7		95	0	5		6.7	82.8	10.4	
PHF	.500	.000	.875	.800	.250	.684	.750	.655	.679	.000	.250	.714	.563	.750	.700	.744

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

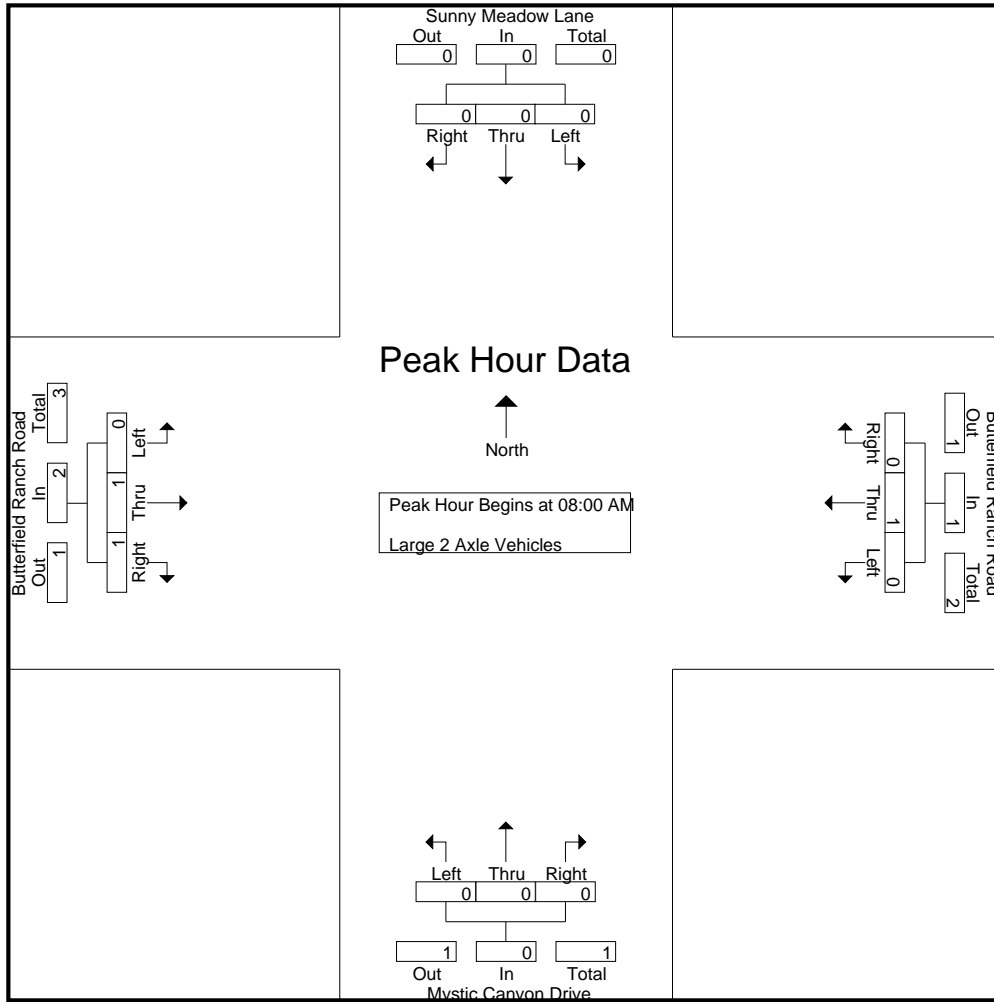
Groups Printed- Large 2 Axle Vehicles

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	3	0	3	0	0	2	2	0	1	0	1	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	2	3
Grand Total	0	0	0	0	0	4	0	4	0	0	2	2	0	2	1	3	9
Apprch %	0	0	0		0	100	0		0	0	100		0	66.7	33.3		
Total %	0	0	0	0	0	44.4	0	44.4	0	0	22.2	22.2	0	22.2	11.1	33.3	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	2	3
% App. Total	0	0	0		0	100	0		0	0	0		0	50	50		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.250	.500	.375

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	2
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	50	50	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.250	.500

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

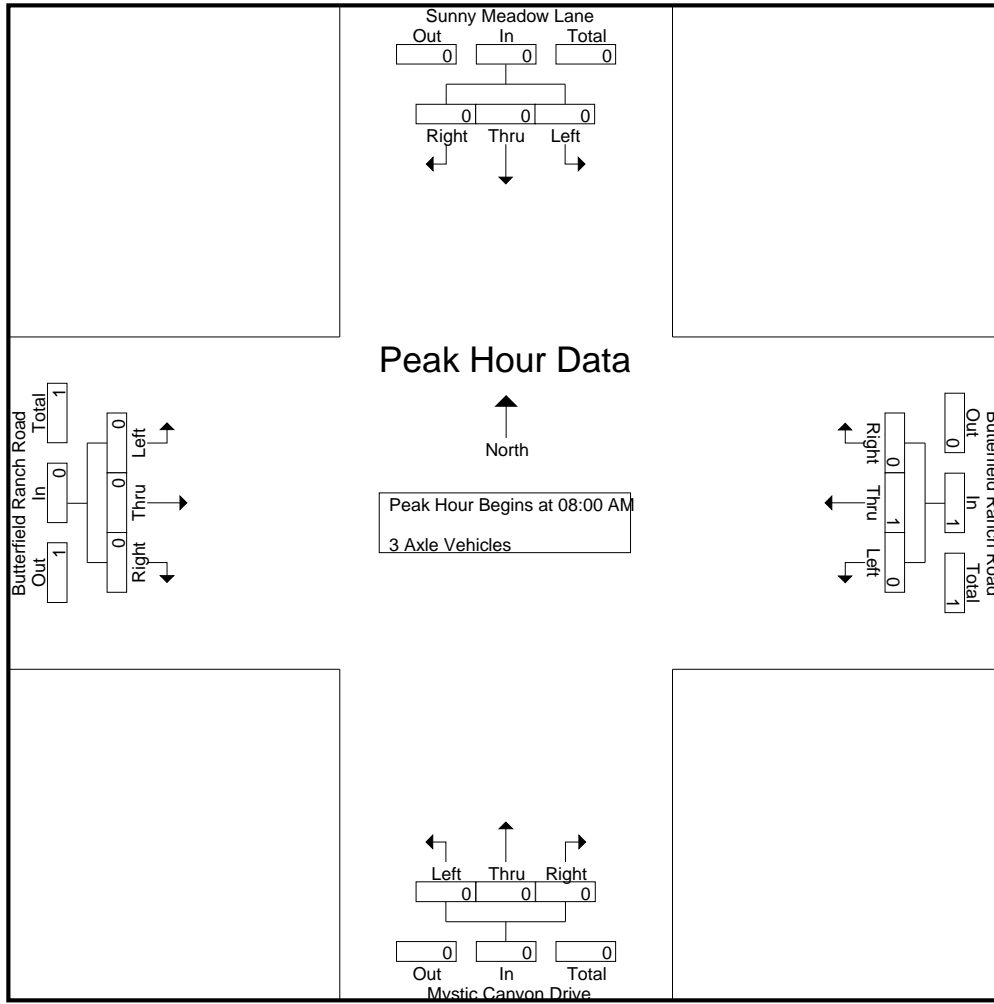
Groups Printed- 3 Axle Vehicles

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		0	100	0		0	0	0		0	0	0		
Total %	0	0	0		0	100	0	100	0	0	0		0	0	0		

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
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Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

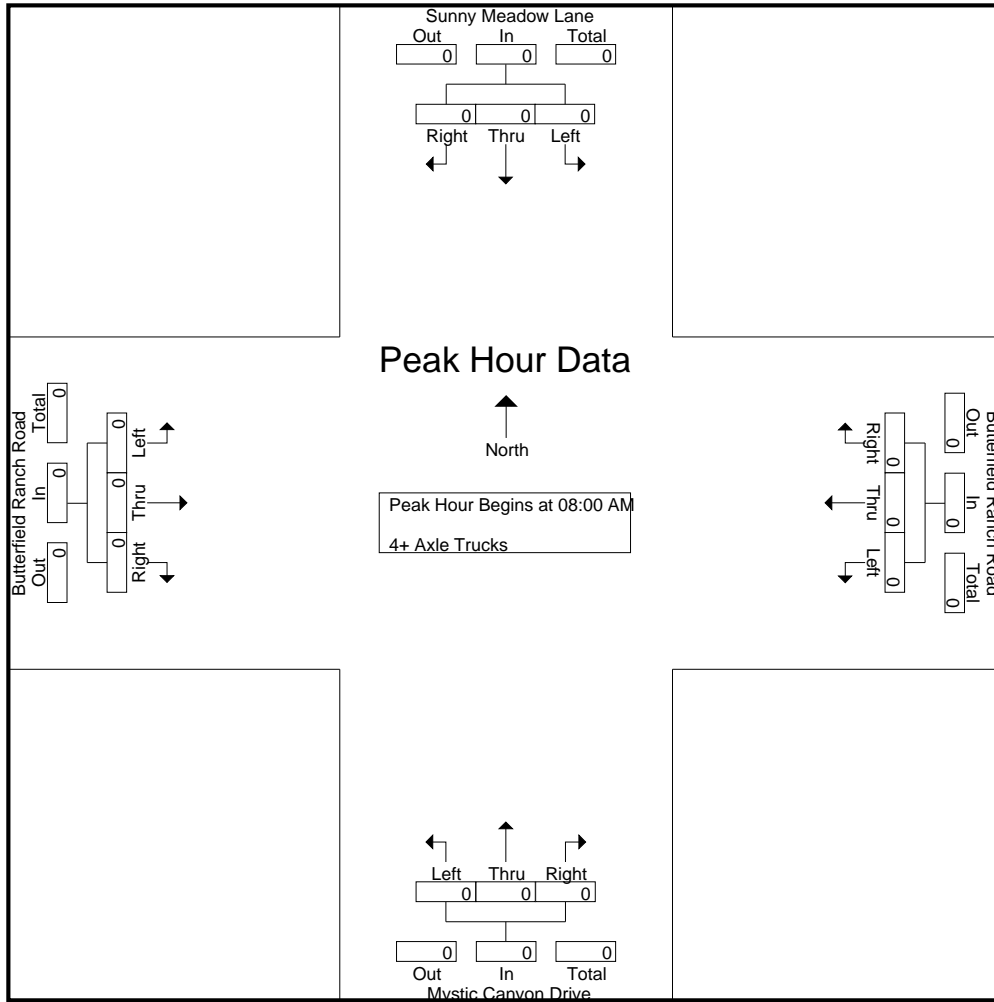
Groups Printed- 4+ Axle Trucks

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter AM
 Site Code : 05720438
 Start Date : 11/19/2020
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Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				08:00 AM				08:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

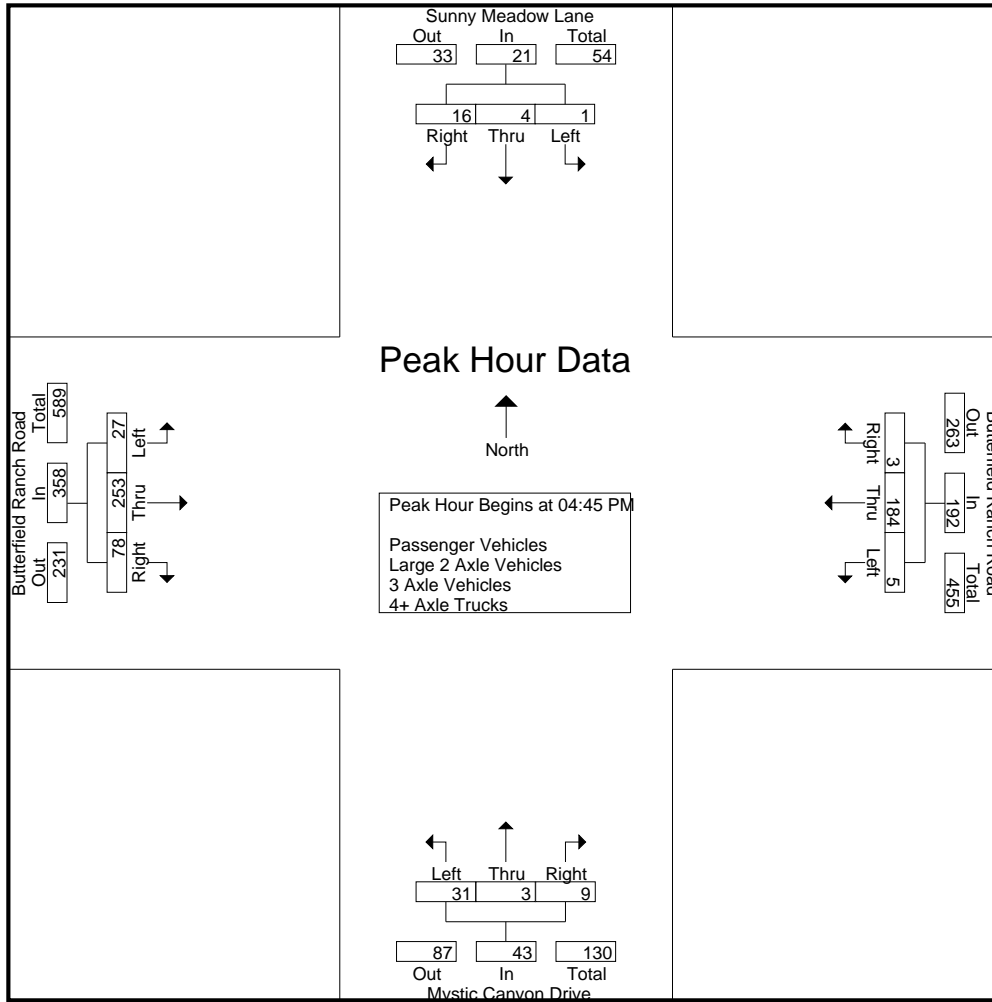
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	7	7	3	38	0	41	7	0	2	9	1	59	13	73	130
04:15 PM	0	0	3	3	1	35	1	37	7	0	1	8	7	64	15	86	134
04:30 PM	0	2	3	5	1	38	0	39	4	0	0	4	7	55	9	71	119
04:45 PM	0	3	4	7	1	56	0	57	11	0	3	14	8	45	17	70	148
Total	0	5	17	22	6	167	1	174	29	0	6	35	23	223	54	300	531
05:00 PM	1	1	5	7	0	42	2	44	4	1	2	7	3	53	21	77	135
05:15 PM	0	0	5	5	1	42	1	44	12	1	3	16	8	86	21	115	180
05:30 PM	0	0	2	2	3	44	0	47	4	1	1	6	8	69	19	96	151
05:45 PM	0	0	1	1	0	37	0	37	4	0	4	8	7	60	17	84	130
Total	1	1	13	15	4	165	3	172	24	3	10	37	26	268	78	372	596
Grand Total	1	6	30	37	10	332	4	346	53	3	16	72	49	491	132	672	1127
Apprch %	2.7	16.2	81.1		2.9	96	1.2		73.6	4.2	22.2		7.3	73.1	19.6		
Total %	0.1	0.5	2.7	3.3	0.9	29.5	0.4	30.7	4.7	0.3	1.4	6.4	4.3	43.6	11.7	59.6	
Passenger Vehicles	1	6	29	36	10	331	4	345	53	3	16	72	49	486	130	665	1118
% Passenger Vehicles	100	100	96.7	97.3	100	99.7	100	99.7	100	100	100	100	100	99	98.5	99	99.2
Large 2 Axle Vehicles	0	0	1	1	0	1	0	1	0	0	0	0	0	5	2	7	9
% Large 2 Axle Vehicles	0	0	3.3	2.7	0	0.3	0	0.3	0	0	0	0	0	1	1.5	1	0.8
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	3	4	7	1	56	0	57	11	0	3	14	8	45	17	70	148
05:00 PM	1	1	5	7	0	42	2	44	4	1	2	7	3	53	21	77	135
05:15 PM	0	0	5	5	1	42	1	44	12	1	3	16	8	86	21	115	180
05:30 PM	0	0	2	2	3	44	0	47	4	1	1	6	8	69	19	96	151
Total Volume	1	4	16	21	5	184	3	192	31	3	9	43	27	253	78	358	614
% App. Total	4.8	19	76.2		2.6	95.8	1.6		72.1	7	20.9		7.5	70.7	21.8		
PHF	.250	.333	.800	.750	.417	.821	.375	.842	.646	.750	.750	.672	.844	.735	.929	.778	.853

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	0	2	3	5	1	56	0	57	11	0	3	14	3	53	21	77
+15 mins.	0	3	4	7	0	42	2	44	4	1	2	7	8	86	21	115
+30 mins.	1	1	5	7	1	42	1	44	12	1	3	16	8	69	19	96
+45 mins.	0	0	5	5	3	44	0	47	4	1	1	6	7	60	17	84
Total Volume	1	6	17	24	5	184	3	192	31	3	9	43	26	268	78	372
% App. Total	4.2	25	70.8		2.6	95.8	1.6		72.1	7	20.9		7	72	21	
PHF	.250	.500	.850	.857	.417	.821	.375	.842	.646	.750	.750	.672	.813	.779	.929	.809

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

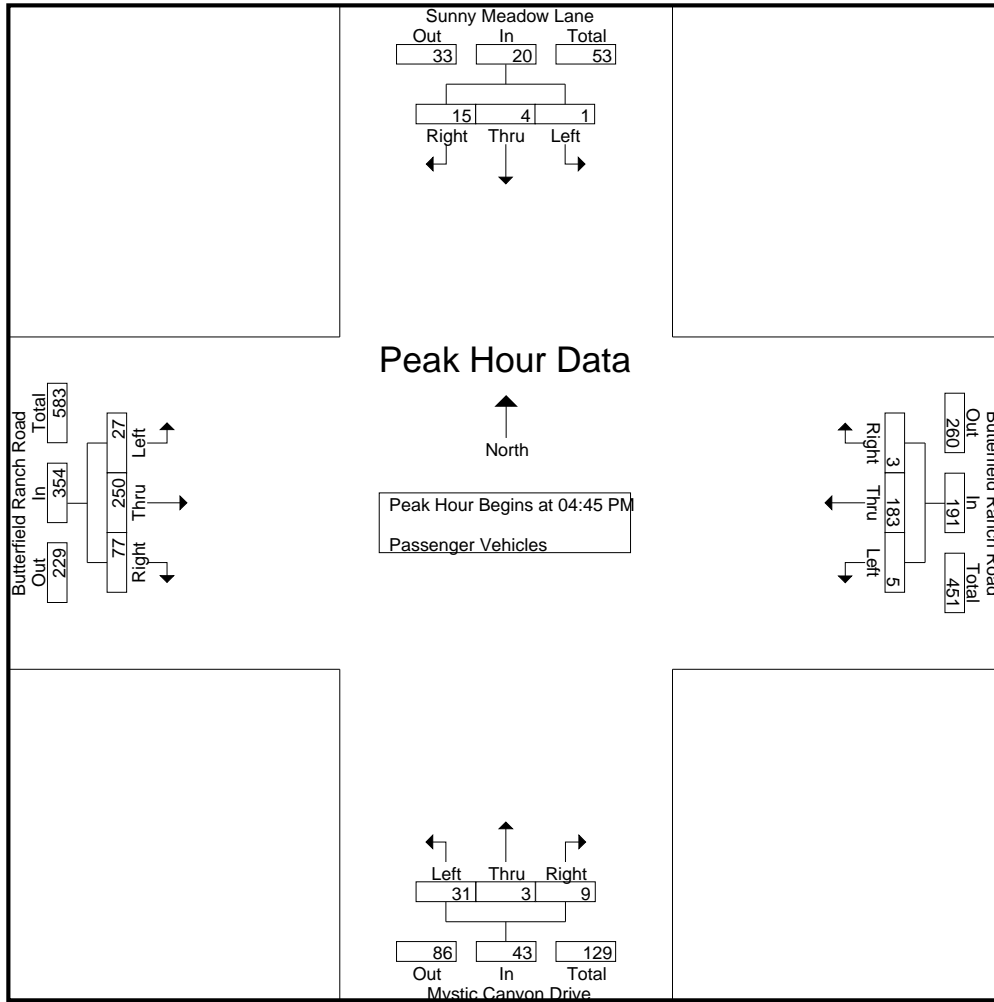
Groups Printed- Passenger Vehicles

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	7	7	3	38	0	41	7	0	2	9	1	58	12	71	128
04:15 PM	0	0	3	3	1	35	1	37	7	0	1	8	7	63	15	85	133
04:30 PM	0	2	3	5	1	38	0	39	4	0	0	4	7	55	9	71	119
04:45 PM	0	3	3	6	1	56	0	57	11	0	3	14	8	45	17	70	147
Total	0	5	16	21	6	167	1	174	29	0	6	35	23	221	53	297	527
05:00 PM	1	1	5	7	0	41	2	43	4	1	2	7	3	53	20	76	133
05:15 PM	0	0	5	5	1	42	1	44	12	1	3	16	8	85	21	114	179
05:30 PM	0	0	2	2	3	44	0	47	4	1	1	6	8	67	19	94	149
05:45 PM	0	0	1	1	0	37	0	37	4	0	4	8	7	60	17	84	130
Total	1	1	13	15	4	164	3	171	24	3	10	37	26	265	77	368	591
Grand Total	1	6	29	36	10	331	4	345	53	3	16	72	49	486	130	665	1118
Apprch %	2.8	16.7	80.6		2.9	95.9	1.2		73.6	4.2	22.2		7.4	73.1	19.5		
Total %	0.1	0.5	2.6	3.2	0.9	29.6	0.4	30.9	4.7	0.3	1.4	6.4	4.4	43.5	11.6	59.5	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	3	3	6	1	56	0	57	11	0	3	14	8	45	17	70	147
05:00 PM	1	1	5	7	0	41	2	43	4	1	2	7	3	53	20	76	133
05:15 PM	0	0	5	5	1	42	1	44	12	1	3	16	8	85	21	114	179
05:30 PM	0	0	2	2	3	44	0	47	4	1	1	6	8	67	19	94	149
Total Volume	1	4	15	20	5	183	3	191	31	3	9	43	27	250	77	354	608
% App. Total	5	20	75		2.6	95.8	1.6		72.1	7	20.9		7.6	70.6	21.8		
PHF	.250	.333	.750	.714	.417	.817	.375	.838	.646	.750	.750	.672	.844	.735	.917	.776	.849

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	3	3	6	1	56	0	57	11	0	3	14	8	45	17	70
+15 mins.	1	1	5	7	0	41	2	43	4	1	2	7	3	53	20	76
+30 mins.	0	0	5	5	1	42	1	44	12	1	3	16	8	85	21	114
+45 mins.	0	0	2	2	3	44	0	47	4	1	1	6	8	67	19	94
Total Volume	1	4	15	20	5	183	3	191	31	3	9	43	27	250	77	354
% App. Total	5	20	75		2.6	95.8	1.6		72.1	7	20.9		7.6	70.6	21.8	
PHF	.250	.333	.750	.714	.417	.817	.375	.838	.646	.750	.750	.672	.844	.735	.917	.776

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

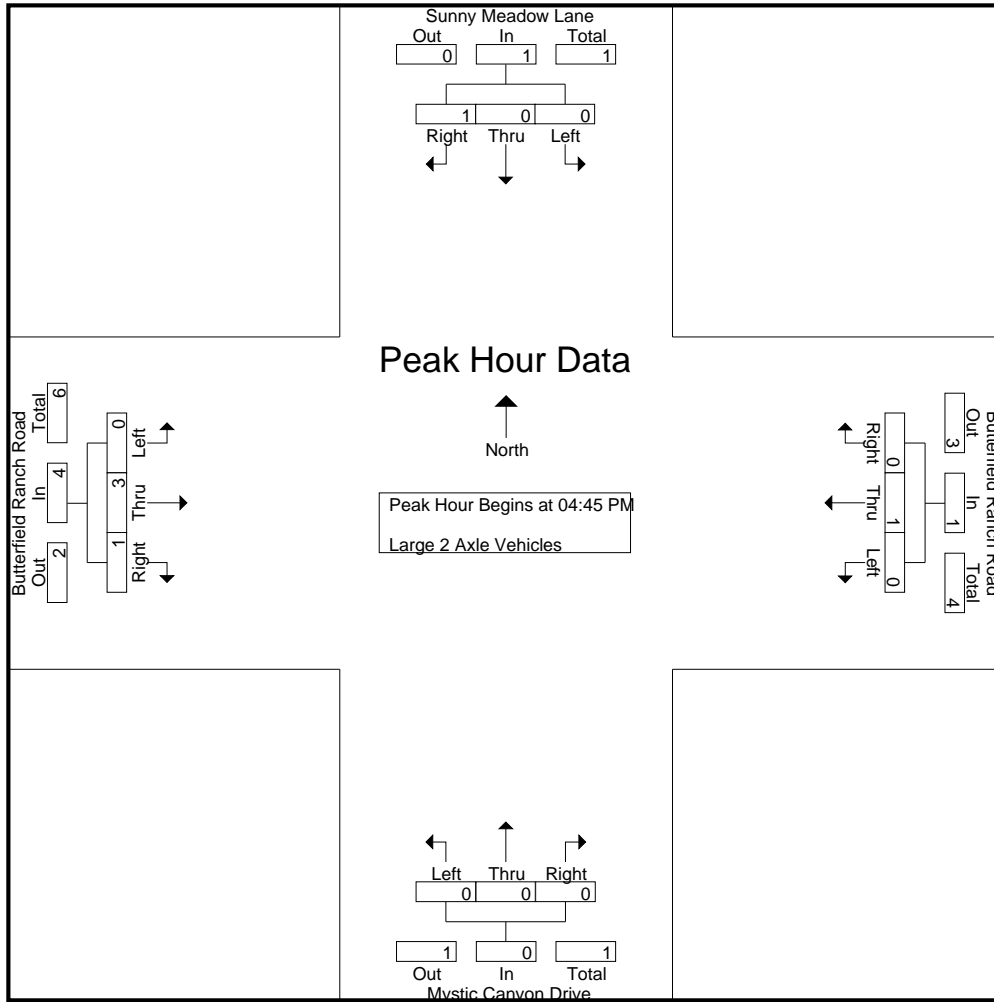
Groups Printed- Large 2 Axle Vehicles

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	1	1	0	0	0	0	0	0	0	0	0	2	1	3	4
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	3	1	4	5
Grand Total	0	0	1	1	0	1	0	1	0	0	0	0	0	5	2	7	9
Apprch %	0	0	100		0	100	0		0	0	0		0	71.4	28.6		
Total %	0	0	11.1	11.1	0	11.1	0	11.1	0	0	0	0	0	55.6	22.2	77.8	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	1	1	0	1	0	1	0	0	0	0	0	3	1	4	6
% App. Total	0	0	100		0	100	0		0	0	0		0	75	25		
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.375	.250	.500	.750

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Total Volume	0	0	1	1	0	1	0	1	0	0	0	0	0	3	1	4
% App. Total	0	0	100		0	100	0		0	0	0		0	75	25	
PHF	.000	.000	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.375	.250	.500

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

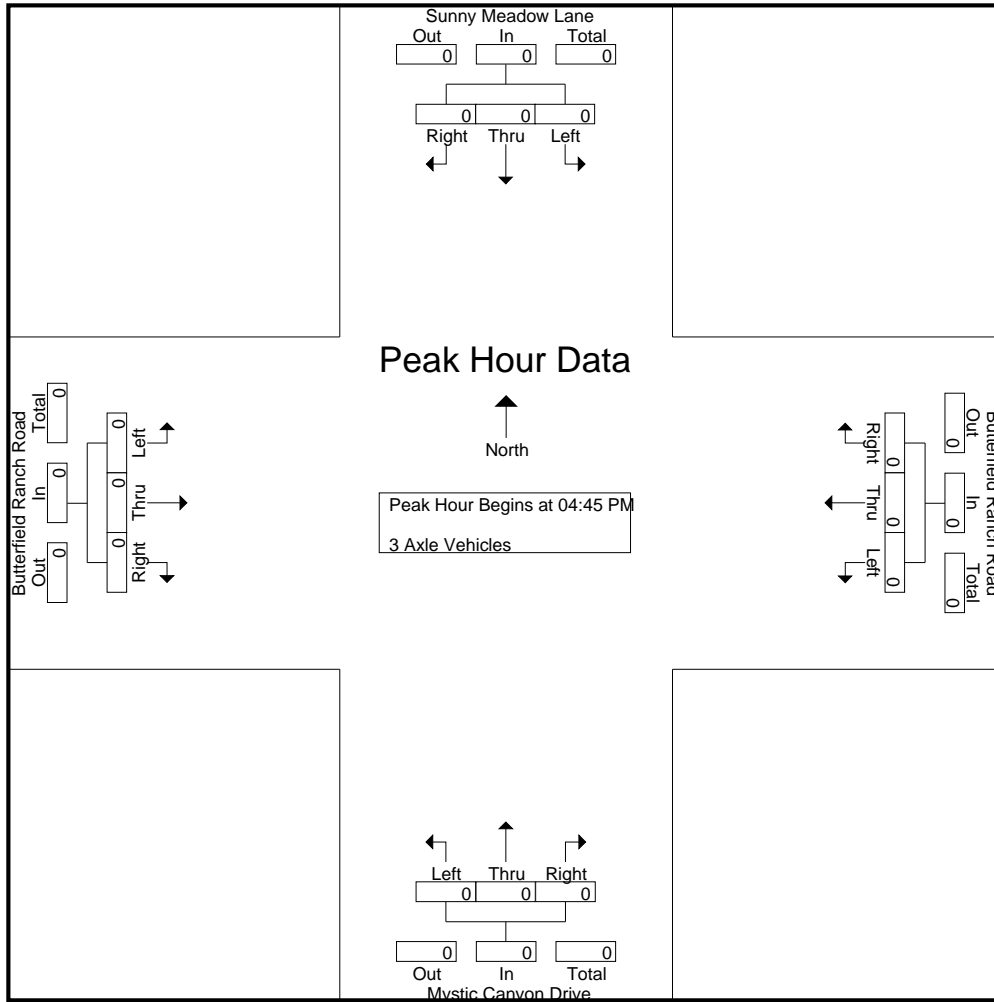
Groups Printed- 3 Axle Vehicles

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

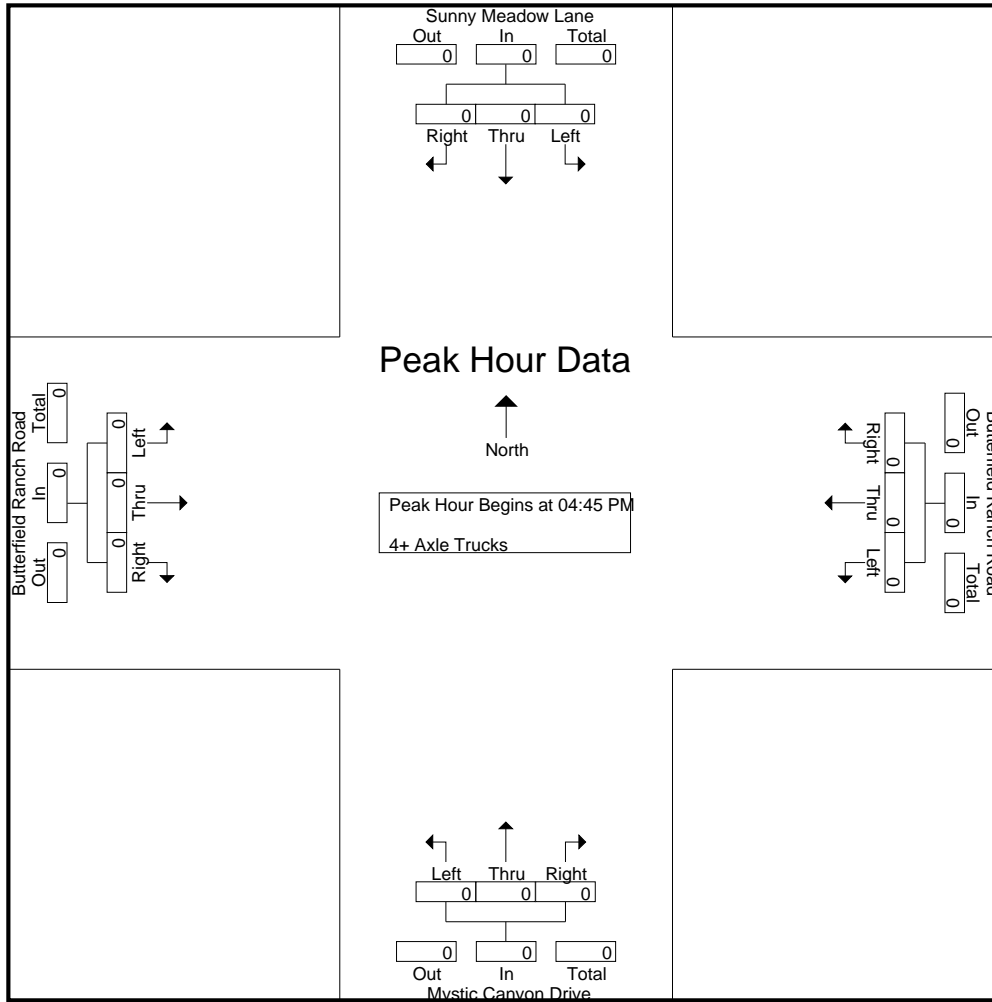
Groups Printed- 4+ Axle Trucks

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Sunny Meadow Lane Southbound				Butterfield Ranch Road Westbound				Mystic Canyon Drive Northbound				Butterfield Ranch Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Sunny Meadow Ln/Mystic Canyon Drive
 E/W: Butterfield Ranch Road
 Weather: Clear

File Name : 05_CHH_Mystic_Butter PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

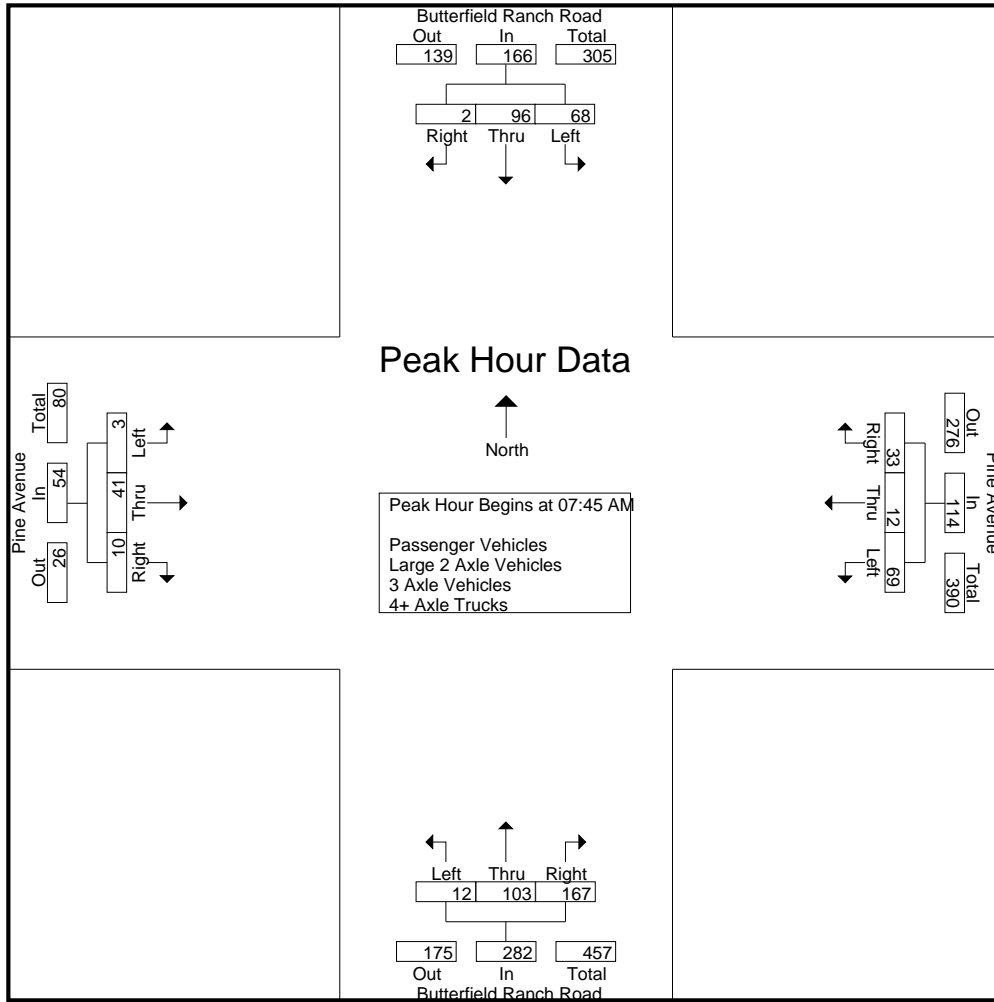
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	15	20	0	35	5	1	7	13	0	21	23	44	1	6	0	7	99
07:15 AM	14	10	0	24	5	3	9	17	1	9	30	40	0	11	3	14	95
07:30 AM	20	20	0	40	8	3	8	19	0	19	39	58	0	7	2	9	126
07:45 AM	17	23	1	41	12	4	9	25	4	24	50	78	1	7	1	9	153
Total	66	73	1	140	30	11	33	74	5	73	142	220	2	31	6	39	473
08:00 AM	16	23	0	39	18	4	7	29	2	19	39	60	2	15	3	20	148
08:15 AM	22	19	0	41	17	2	7	26	4	28	41	73	0	9	1	10	150
08:30 AM	13	31	1	45	22	2	10	34	2	32	37	71	0	10	5	15	165
08:45 AM	16	23	2	41	15	2	8	25	3	27	31	61	0	10	0	10	137
Total	67	96	3	166	72	10	32	114	11	106	148	265	2	44	9	55	600
Grand Total	133	169	4	306	102	21	65	188	16	179	290	485	4	75	15	94	1073
Apprch %	43.5	55.2	1.3		54.3	11.2	34.6		3.3	36.9	59.8		4.3	79.8	16		
Total %	12.4	15.8	0.4	28.5	9.5	2	6.1	17.5	1.5	16.7	27	45.2	0.4	7	1.4	8.8	
Passenger Vehicles	133	166	4	303	96	21	59	176	16	173	290	479	4	75	15	94	1052
% Passenger Vehicles	100	98.2	100	99	94.1	100	90.8	93.6	100	96.6	100	98.8	100	100	100	100	98
Large 2 Axle Vehicles	0	3	0	3	6	0	5	11	0	6	0	6	0	0	0	0	20
% Large 2 Axle Vehicles	0	1.8	0	1	5.9	0	7.7	5.9	0	3.4	0	1.2	0	0	0	0	1.9
3 Axle Vehicles	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0	1.5	0.5	0	0	0	0	0	0	0	0	0.1
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	17	23	1	41	12	4	9	25	4	24	50	78	1	7	1	9	153
08:00 AM	16	23	0	39	18	4	7	29	2	19	39	60	2	15	3	20	148
08:15 AM	22	19	0	41	17	2	7	26	4	28	41	73	0	9	1	10	150
08:30 AM	13	31	1	45	22	2	10	34	2	32	37	71	0	10	5	15	165
Total Volume	68	96	2	166	69	12	33	114	12	103	167	282	3	41	10	54	616
% App. Total	41	57.8	1.2		60.5	10.5	28.9		4.3	36.5	59.2		5.6	75.9	18.5		
PHF	.773	.774	.500	.922	.784	.750	.825	.838	.750	.805	.835	.904	.375	.683	.500	.675	.933

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				08:00 AM			
+0 mins.	17	23	1	41	12	4	9	25	4	24	50	78	2	15	3	20
+15 mins.	16	23	0	39	18	4	7	29	2	19	39	60	0	9	1	10
+30 mins.	22	19	0	41	17	2	7	26	4	28	41	73	0	10	5	15
+45 mins.	13	31	1	45	22	2	10	34	2	32	37	71	0	10	0	10
Total Volume	68	96	2	166	69	12	33	114	12	103	167	282	2	44	9	55
% App. Total	41	57.8	1.2		60.5	10.5	28.9		4.3	36.5	59.2		3.6	80	16.4	
PHF	.773	.774	.500	.922	.784	.750	.825	.838	.750	.805	.835	.904	.250	.733	.450	.688

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

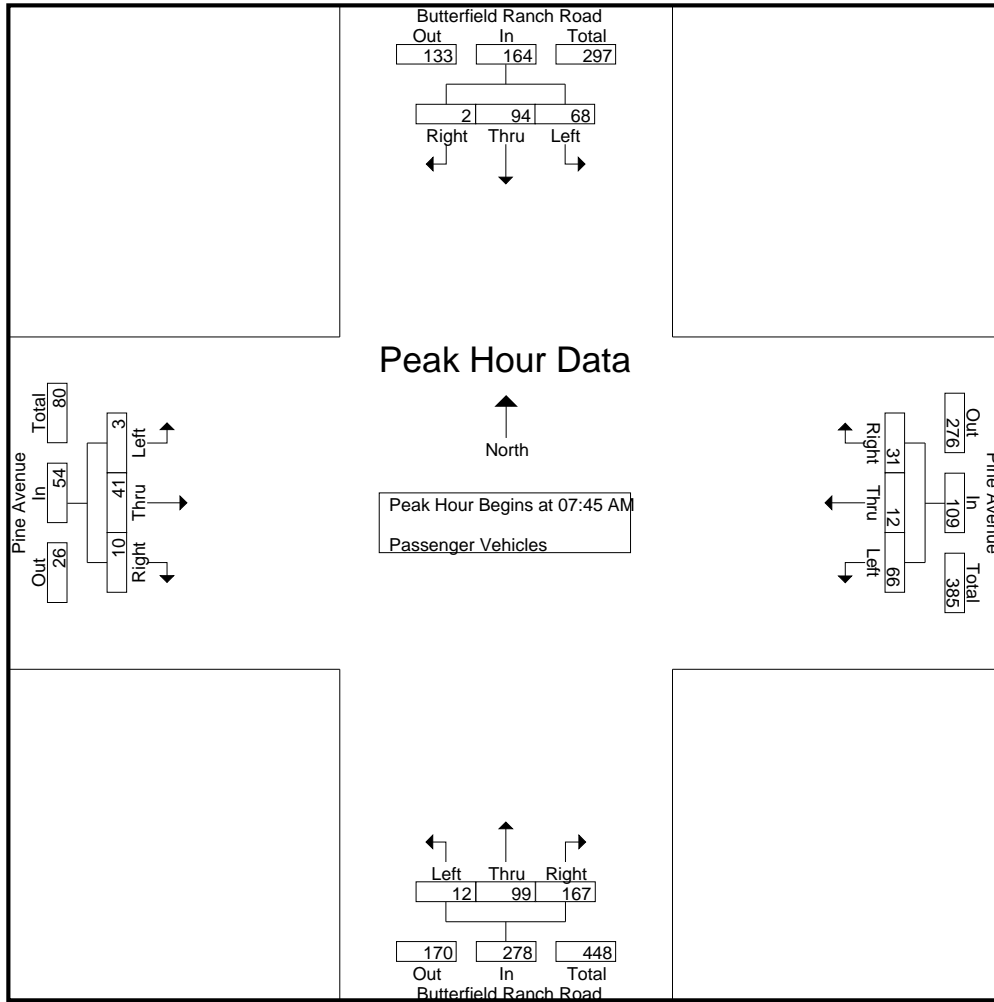
Groups Printed- Passenger Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	15	19	0	34	3	1	5	9	0	20	23	43	1	6	0	7	93
07:15 AM	14	10	0	24	4	3	9	16	1	9	30	40	0	11	3	14	94
07:30 AM	20	20	0	40	8	3	6	17	0	18	39	57	0	7	2	9	123
07:45 AM	17	22	1	40	12	4	8	24	4	22	50	76	1	7	1	9	149
Total	66	71	1	138	27	11	28	66	5	69	142	216	2	31	6	39	459
08:00 AM	16	22	0	38	16	4	7	27	2	19	39	60	2	15	3	20	145
08:15 AM	22	19	0	41	16	2	7	25	4	27	41	72	0	9	1	10	148
08:30 AM	13	31	1	45	22	2	9	33	2	31	37	70	0	10	5	15	163
08:45 AM	16	23	2	41	15	2	8	25	3	27	31	61	0	10	0	10	137
Total	67	95	3	165	69	10	31	110	11	104	148	263	2	44	9	55	593
Grand Total	133	166	4	303	96	21	59	176	16	173	290	479	4	75	15	94	1052
Apprch %	43.9	54.8	1.3		54.5	11.9	33.5		3.3	36.1	60.5		4.3	79.8	16		
Total %	12.6	15.8	0.4	28.8	9.1	2	5.6	16.7	1.5	16.4	27.6	45.5	0.4	7.1	1.4	8.9	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	17	22	1	40	12	4	8	24	4	22	50	76	1	7	1	9	149
08:00 AM	16	22	0	38	16	4	7	27	2	19	39	60	2	15	3	20	145
08:15 AM	22	19	0	41	16	2	7	25	4	27	41	72	0	9	1	10	148
08:30 AM	13	31	1	45	22	2	9	33	2	31	37	70	0	10	5	15	163
Total Volume	68	94	2	164	66	12	31	109	12	99	167	278	3	41	10	54	605
% App. Total	41.5	57.3	1.2		60.6	11	28.4		4.3	35.6	60.1		5.6	75.9	18.5		
PHF	.773	.758	.500	.911	.750	.750	.861	.826	.750	.798	.835	.914	.375	.683	.500	.675	.928

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM				
+0 mins.	17	22	1	40	12	4	8	24	4	22	50	76	1	7	1	9	
+15 mins.	16	22	0	38	16	4	7	27	2	19	39	60	2	15	3	20	
+30 mins.	22	19	0	41	16	2	7	25	4	27	41	72	0	9	1	10	
+45 mins.	13	31	1	45	22	2	9	33	2	31	37	70	0	10	5	15	
Total Volume	68	94	2	164	66	12	31	109	12	99	167	278	3	41	10	54	
% App. Total	41.5	57.3	1.2	60.6	60.6	11	28.4	4.3	35.6	60.1	5.6	75.9	18.5				
PHF	.773	.758	.500	.911	.750	.750	.861	.826	.750	.798	.835	.914	.375	.683	.500	.675	

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

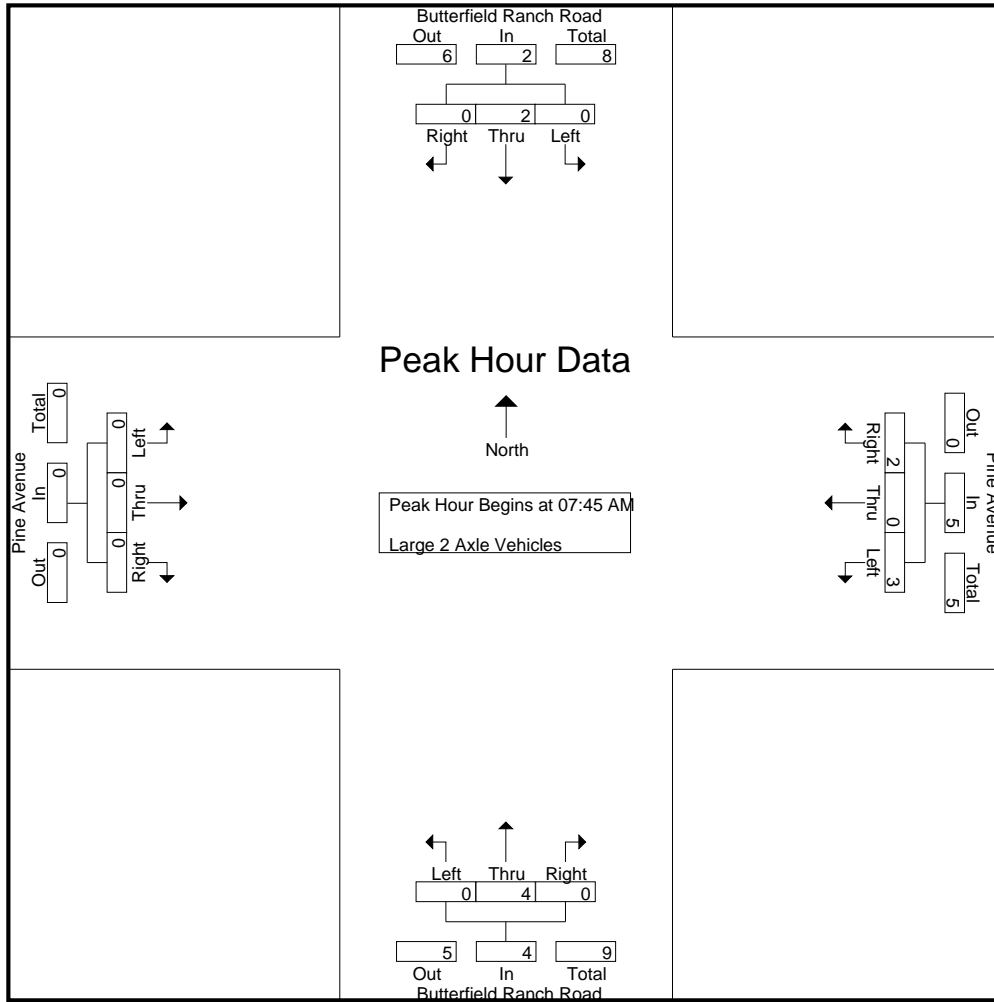
Groups Printed- Large 2 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	1	0	1	2	0	1	3	0	1	0	1	0	0	0	0	5
07:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	2	2	0	1	0	1	0	0	0	0	3
07:45 AM	0	1	0	1	0	0	1	1	0	2	0	2	0	0	0	0	4
Total	0	2	0	2	3	0	4	7	0	4	0	4	0	0	0	0	13
08:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	3	0	1	4	0	2	0	2	0	0	0	0	7
Grand Total	0	3	0	3	6	0	5	11	0	6	0	6	0	0	0	0	20
Apprch %	0	100	0		54.5	0	45.5		0	100	0		0	0	0		
Total %	0	15	0	15	30	0	25	55	0	30	0	30	0	0	0	0	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	1	0	1	0	0	1	1	0	2	0	2	0	0	0	0	4
08:00 AM	0	1	0	1	2	0	0	2	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0	2
Total Volume	0	2	0	2	3	0	2	5	0	4	0	4	0	0	0	0	11
% App. Total	0	100	0		60	0	40		0	100	0		0	0	0		
PHF	.000	.500	.000	.500	.375	.000	.500	.625	.000	.500	.000	.500	.000	.000	.000	.000	.688

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	1	0	1	0	0	1	1	0	2	0	2	0	0	0	0
+15 mins.	0	1	0	1	2	0	0	2	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	1	0	1	0	1	0	0	0	0
Total Volume	0	2	0	2	3	0	2	5	0	4	0	4	0	0	0	0
% App. Total	0	100	0	0	60	0	40	0	0	100	0	0	0	0	0	0
PHF	.000	.500	.000	.500	.375	.000	.500	.625	.000	.500	.000	.500	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

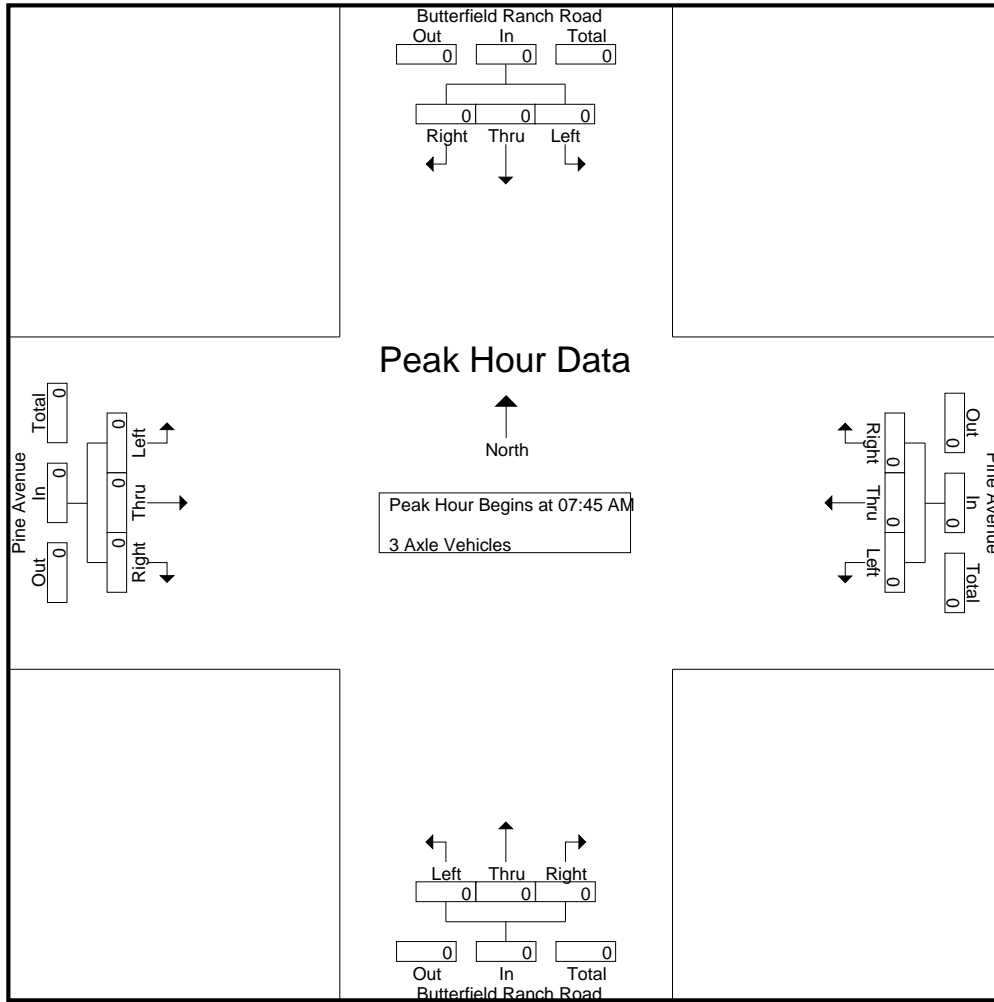
Groups Printed- 3 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		0	0	100		0	0	0		0	0	0		
Total %	0	0	0		0	0	100	100	0	0	0		0	0	0		

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

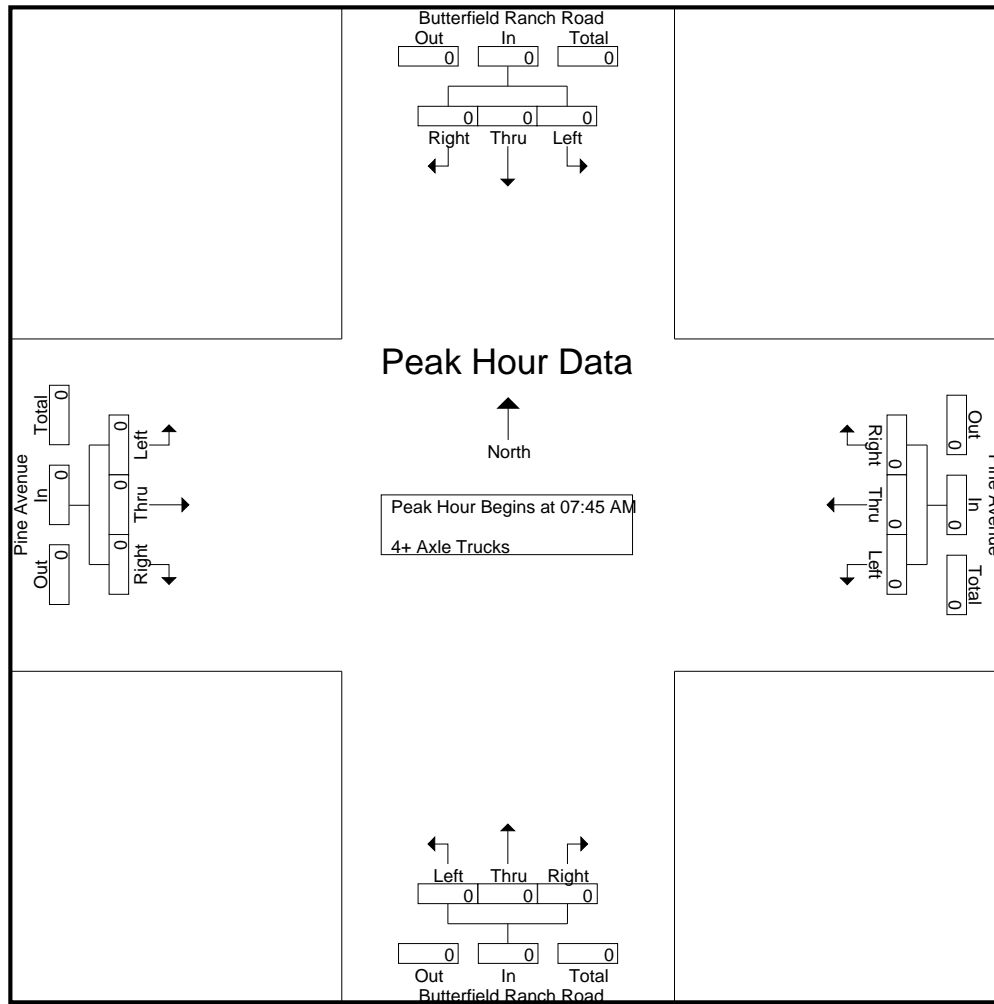
Groups Printed- 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine AM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:45 AM				07:45 AM				07:45 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

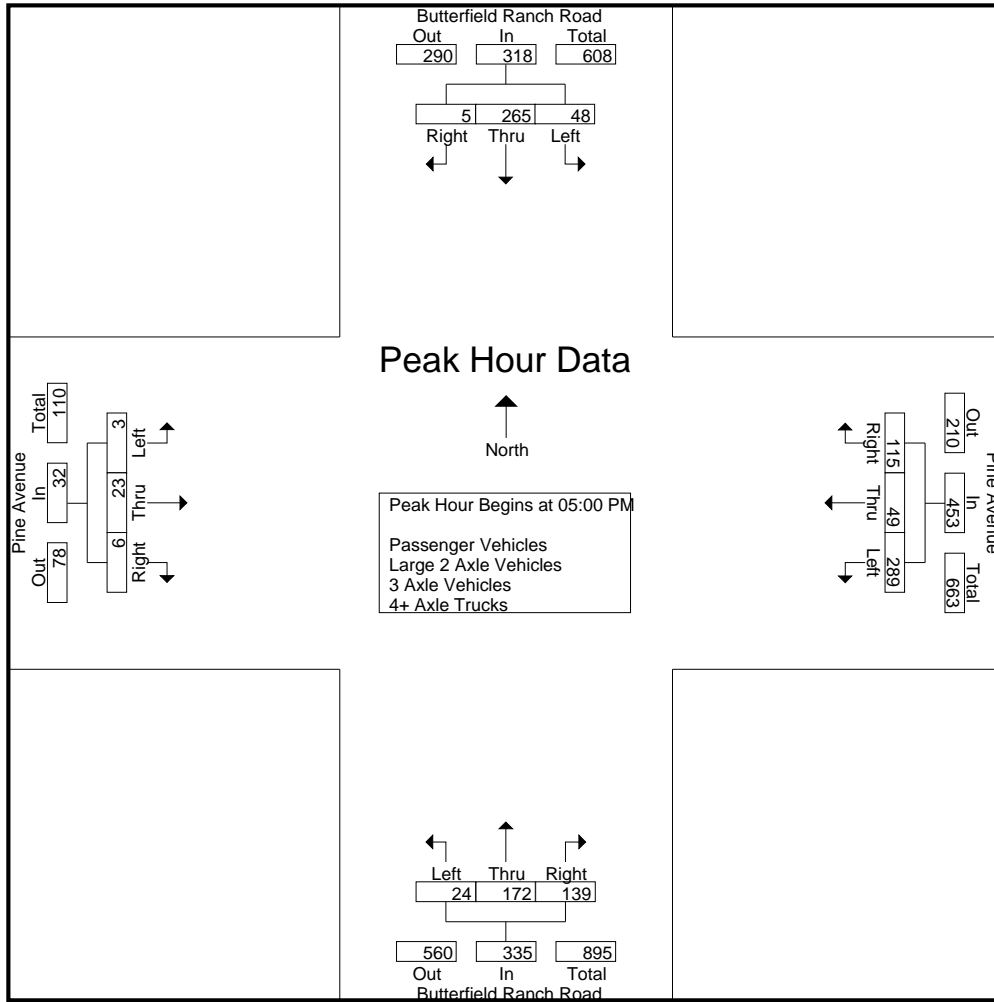
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	14	62	0	76	54	12	22	88	6	40	28	74	2	4	5	11	249
04:15 PM	10	62	4	76	85	7	31	123	4	32	28	64	0	4	4	8	271
04:30 PM	12	62	2	76	63	9	19	91	6	51	36	93	4	7	2	13	273
04:45 PM	8	47	3	58	51	14	26	91	3	47	34	84	0	10	1	11	244
Total	44	233	9	286	253	42	98	393	19	170	126	315	6	25	12	43	1037
05:00 PM	10	67	0	77	55	9	22	86	9	41	36	86	0	8	0	8	257
05:15 PM	13	84	1	98	86	13	22	121	4	52	38	94	3	9	4	16	329
05:30 PM	15	60	4	79	75	12	33	120	4	48	31	83	0	3	2	5	287
05:45 PM	10	54	0	64	73	15	38	126	7	31	34	72	0	3	0	3	265
Total	48	265	5	318	289	49	115	453	24	172	139	335	3	23	6	32	1138
Grand Total	92	498	14	604	542	91	213	846	43	342	265	650	9	48	18	75	2175
Apprch %	15.2	82.5	2.3		64.1	10.8	25.2		6.6	52.6	40.8		12	64	24		
Total %	4.2	22.9	0.6	27.8	24.9	4.2	9.8	38.9	2	15.7	12.2	29.9	0.4	2.2	0.8	3.4	
Passenger Vehicles	86	495	14	595	539	91	209	839	43	340	259	642	9	48	17	74	2150
% Passenger Vehicles	93.5	99.4	100	98.5	99.4	100	98.1	99.2	100	99.4	97.7	98.8	100	100	94.4	98.7	98.9
Large 2 Axle Vehicles	6	3	0	9	3	0	4	7	0	1	6	7	0	0	1	1	24
% Large 2 Axle Vehicles	6.5	0.6	0	1.5	0.6	0	1.9	0.8	0	0.3	2.3	1.1	0	0	5.6	1.3	1.1
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0.3	0	0.2	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	10	67	0	77	55	9	22	86	9	41	36	86	0	8	0	8	257
05:15 PM	13	84	1	98	86	13	22	121	4	52	38	94	3	9	4	16	329
05:30 PM	15	60	4	79	75	12	33	120	4	48	31	83	0	3	2	5	287
05:45 PM	10	54	0	64	73	15	38	126	7	31	34	72	0	3	0	3	265
Total Volume	48	265	5	318	289	49	115	453	24	172	139	335	3	23	6	32	1138
% App. Total	15.1	83.3	1.6		63.8	10.8	25.4		7.2	51.3	41.5		9.4	71.9	18.8		
PHF	.800	.789	.313	.811	.840	.817	.757	.899	.667	.827	.914	.891	.250	.639	.375	.500	.865

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:30 PM				04:30 PM			
+0 mins.	10	67	0	77	55	9	22	86	6	51	36	93	4	7	2	13
+15 mins.	13	84	1	98	86	13	22	121	3	47	34	84	0	10	1	11
+30 mins.	15	60	4	79	75	12	33	120	9	41	36	86	0	8	0	8
+45 mins.	10	54	0	64	73	15	38	126	4	52	38	94	3	9	4	16
Total Volume	48	265	5	318	289	49	115	453	22	191	144	357	7	34	7	48
% App. Total	15.1	83.3	1.6		63.8	10.8	25.4		6.2	53.5	40.3		14.6	70.8	14.6	
PHF	.800	.789	.313	.811	.840	.817	.757	.899	.611	.918	.947	.949	.438	.850	.438	.750

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

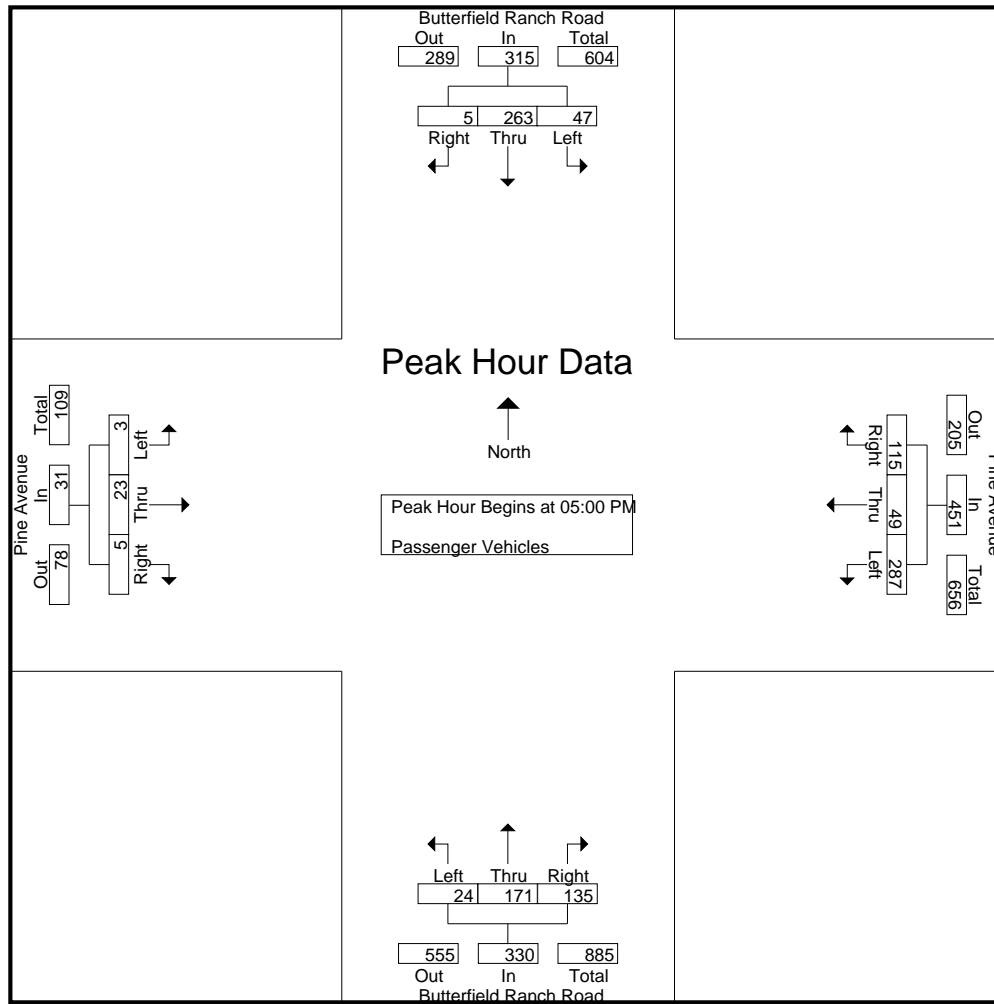
Groups Printed- Passenger Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	12	61	0	73	54	12	21	87	6	40	28	74	2	4	5	11	245
04:15 PM	9	62	4	75	85	7	29	121	4	32	28	64	0	4	4	8	268
04:30 PM	11	62	2	75	62	9	18	89	6	50	35	91	4	7	2	13	268
04:45 PM	7	47	3	57	51	14	26	91	3	47	33	83	0	10	1	11	242
Total	39	232	9	280	252	42	94	388	19	169	124	312	6	25	12	43	1023
05:00 PM	9	67	0	76	55	9	22	86	9	41	36	86	0	8	0	8	256
05:15 PM	13	82	1	96	84	13	22	119	4	51	35	90	3	9	4	16	321
05:30 PM	15	60	4	79	75	12	33	120	4	48	31	83	0	3	1	4	286
05:45 PM	10	54	0	64	73	15	38	126	7	31	33	71	0	3	0	3	264
Total	47	263	5	315	287	49	115	451	24	171	135	330	3	23	5	31	1127
Grand Total	86	495	14	595	539	91	209	839	43	340	259	642	9	48	17	74	2150
Apprch %	14.5	83.2	2.4		64.2	10.8	24.9		6.7	53	40.3		12.2	64.9	23		
Total %	4	23	0.7	27.7	25.1	4.2	9.7	39	2	15.8	12	29.9	0.4	2.2	0.8	3.4	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	9	67	0	76	55	9	22	86	9	41	36	86	0	8	0	8	256
05:15 PM	13	82	1	96	84	13	22	119	4	51	35	90	3	9	4	16	321
05:30 PM	15	60	4	79	75	12	33	120	4	48	31	83	0	3	1	4	286
05:45 PM	10	54	0	64	73	15	38	126	7	31	33	71	0	3	0	3	264
Total Volume	47	263	5	315	287	49	115	451	24	171	135	330	3	23	5	31	1127
% App. Total	14.9	83.5	1.6		63.6	10.9	25.5		7.3	51.8	40.9		9.7	74.2	16.1		
PHF	.783	.802	.313	.820	.854	.817	.757	.895	.667	.838	.938	.917	.250	.639	.313	.484	.878

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM							
+0 mins.	9	67	0	76	55	9	22	86	9	41	36	86	0	8	0	8
+15 mins.	13	82	1	96	84	13	22	119	4	51	35	90	3	9	4	16
+30 mins.	15	60	4	79	75	12	33	120	4	48	31	83	0	3	1	4
+45 mins.	10	54	0	64	73	15	38	126	7	31	33	71	0	3	0	3
Total Volume	47	263	5	315	287	49	115	451	24	171	135	330	3	23	5	31
% App. Total	14.9	83.5	1.6		63.6	10.9	25.5		7.3	51.8	40.9		9.7	74.2	16.1	
PHF	.783	.802	.313	.820	.854	.817	.757	.895	.667	.838	.938	.917	.250	.639	.313	.484

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

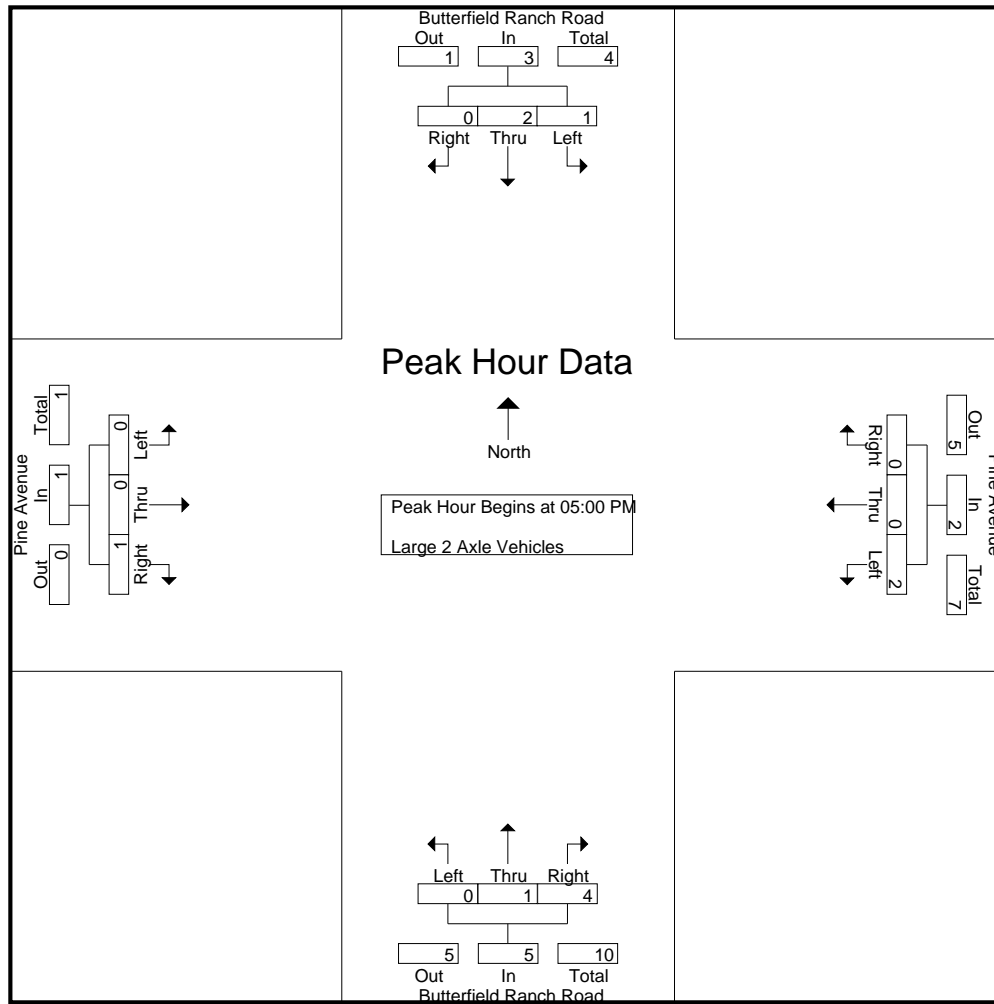
Groups Printed- Large 2 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
04:00 PM	2	1	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	4
04:15 PM	1	0	0	1	0	0	2	2	0	0	0	0	0	0	0	0	0	3
04:30 PM	1	0	0	1	1	0	1	2	0	0	1	1	0	0	0	0	0	4
04:45 PM	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	2
Total	5	1	0	6	1	0	4	5	0	0	2	2	0	0	0	0	0	13
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	2	0	2	2	0	0	2	0	1	3	4	0	0	0	0	0	8
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total	1	2	0	3	2	0	0	2	0	1	4	5	0	0	1	1	1	11
Grand Total	6	3	0	9	3	0	4	7	0	1	6	7	0	0	1	1	1	24
Apprch %	66.7	33.3	0		42.9	0	57.1		0	14.3	85.7		0	0	100			
Total %	25	12.5	0	37.5	12.5	0	16.7	29.2	0	4.2	25	29.2	0	0	4.2	4.2		

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total	
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 05:00 PM																		
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	2	0	2	2	0	0	2	0	1	3	4	0	0	0	0	0	8
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Total Volume	1	2	0	3	2	0	0	2	0	1	4	5	0	0	1	1	1	11
% App. Total	33.3	66.7	0		100	0	0		0	20	80		0	0	100			
PHF	.250	.250	.000	.375	.250	.000	.000	.250	.000	.250	.333	.313	.000	.000	.250	.250		.344

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	2	0	2	2	0	0	2	0	1	3	4	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Total Volume	1	2	0	3	2	0	0	2	0	1	4	5	0	0	1	1
% App. Total	33.3	66.7	0		100	0	0		0	20	80		0	0	100	
PHF	.250	.250	.000	.375	.250	.000	.000	.250	.000	.250	.333	.313	.000	.000	.250	.250

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

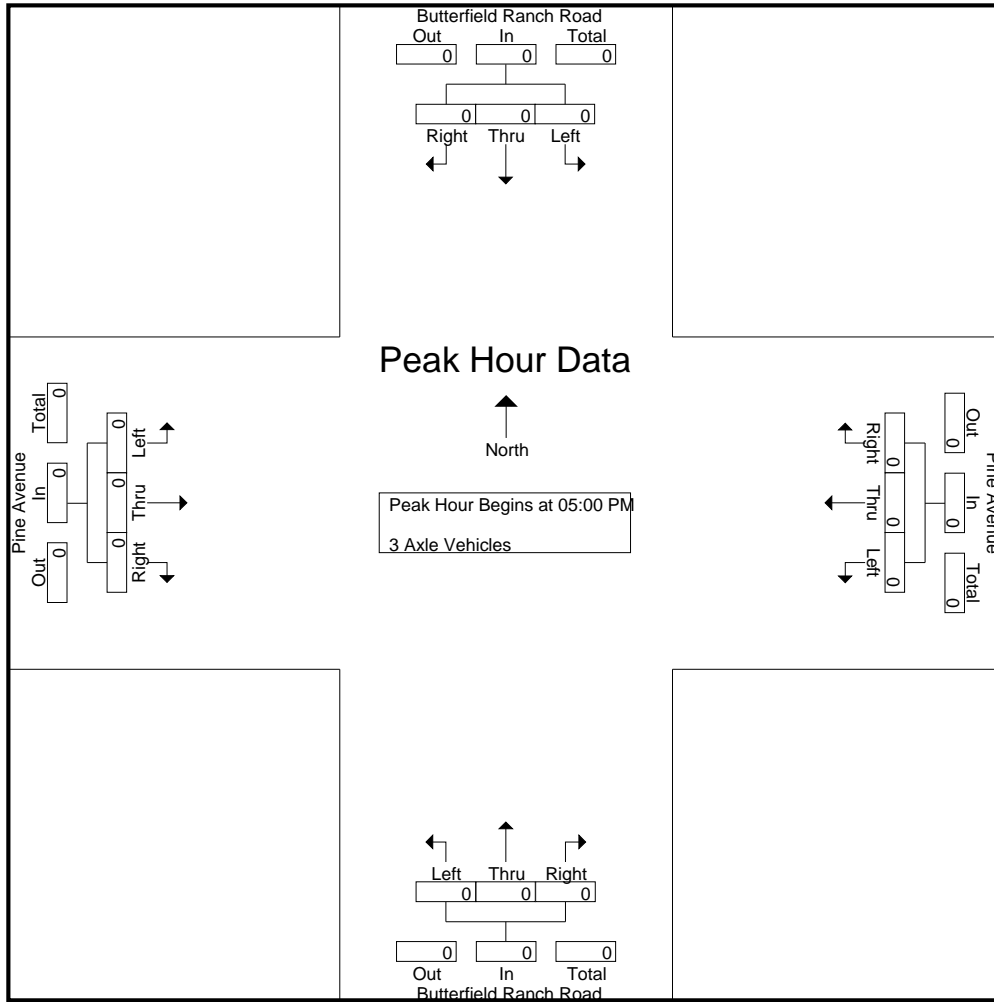
Groups Printed- 3 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Apprch %	0	0	0		0	0	0		0	100	0		0	0	0		
Total %	0	0	0		0	0	0		0	100	0	100	0	0	0		

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 1

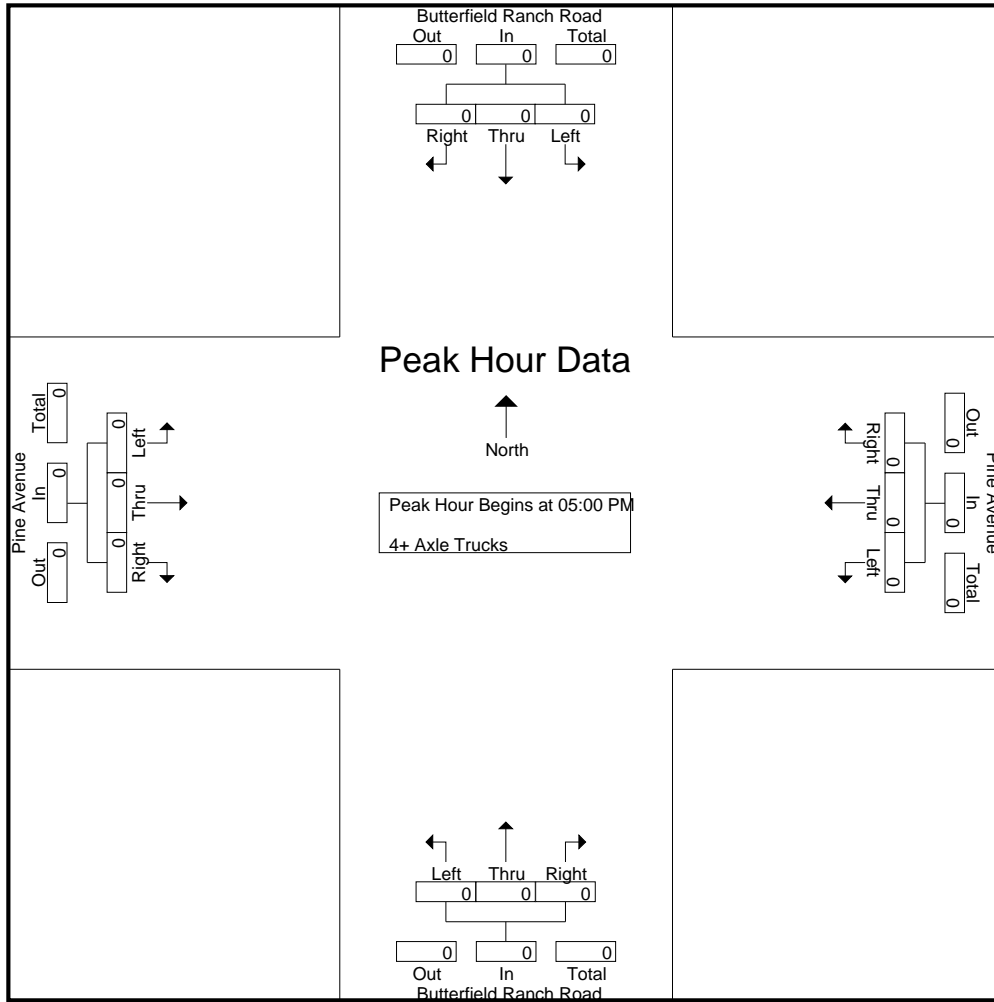
Groups Printed- 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 06_CHH_Butter_Pine PM
 Site Code : 05720438
 Start Date : 11/19/2020
 Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

APPENDIX B-III

ROADWAY SEGMENT COUNTS

Counts Unlimited, Inc.

City of Chino Hills
 Butterfield Ranch Road
 E/ Twin Knolls Drive
 24 Hour Directional Classification Count

PO Box 1178
 Corona, CA 92878
 (951) 268-6268

email: counts@countsunlimited.com

CHH003
 Site Code: 057-20438

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	19	6	0	0	0	0	0	0	0	0	0	0	25
01:00	0	11	3	0	1	0	0	0	0	0	0	0	0	15
02:00	0	9	3	0	0	0	0	0	0	0	0	0	0	12
03:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
04:00	1	29	4	0	1	0	0	0	0	0	0	0	0	35
05:00	1	60	12	0	5	0	0	0	0	0	0	0	0	78
06:00	1	103	25	0	2	0	0	1	0	0	0	0	0	132
07:00	3	155	38	0	8	0	0	1	0	0	0	0	0	205
08:00	3	151	26	1	4	1	0	0	0	0	0	0	0	186
09:00	0	119	26	1	10	0	0	2	0	0	0	0	0	158
10:00	0	114	36	2	7	0	0	1	0	0	0	0	0	160
11:00	1	98	28	0	7	0	0	0	0	0	0	0	0	134
12 PM	0	128	44	1	4	0	0	2	0	0	0	0	0	179
13:00	2	129	27	0	7	0	0	1	0	0	0	1	0	167
14:00	2	136	39	0	11	0	0	4	1	0	0	0	0	193
15:00	4	146	51	0	6	0	0	1	0	0	0	0	0	208
16:00	3	181	41	1	8	0	0	4	0	0	0	0	0	238
17:00	0	229	39	0	13	0	0	1	0	0	0	0	0	282
18:00	2	158	25	0	8	0	0	0	0	0	0	0	0	193
19:00	0	76	20	0	2	0	0	0	0	0	0	0	0	98
20:00	1	51	7	0	4	0	0	0	0	0	0	0	0	63
21:00	0	47	4	0	1	0	0	0	0	0	0	0	0	52
22:00	0	41	2	0	0	0	0	0	0	0	0	0	0	43
23:00	0	14	4	0	0	0	0	0	0	0	0	0	0	18
Total	24	2216	511	6	109	1	0	18	1	0	0	1	0	2887
Percent	0.8%	76.8%	17.7%	0.2%	3.8%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	10:00	09:00	08:00		09:00						07:00
Vol.	3	155	38	2	10	1		2						205
PM Peak	15:00	17:00	15:00	12:00	17:00			14:00	14:00			13:00		17:00
Vol.	4	229	51	1	13			4	1			1		282
Grand Total	24	2216	511	6	109	1	0	18	1	0	0	1	0	2887
Percent	0.8%	76.8%	17.7%	0.2%	3.8%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
 Butterfield Ranch Road
 E/ Twin Knolls Drive
 24 Hour Directional Classification Count

PO Box 1178
 Corona, CA 92878
 (951) 268-6268
 email: counts@countsunlimited.com

CHH003
 Site Code: 057-20438

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	22	4	0	0	0	0	0	0	0	0	0	0	26
01:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
02:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
03:00	0	7	3	0	0	0	0	0	0	0	0	0	0	10
04:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
05:00	0	12	5	0	1	1	0	0	0	0	0	0	0	19
06:00	0	27	13	0	4	0	0	0	0	0	0	0	0	44
07:00	0	44	21	1	8	0	0	4	0	0	0	0	0	78
08:00	0	88	34	0	5	0	0	3	1	0	0	0	0	131
09:00	0	86	18	2	2	0	0	0	0	0	0	0	0	108
10:00	0	83	25	0	7	0	0	1	0	0	0	0	0	116
11:00	0	101	16	0	1	0	0	0	0	0	0	0	0	118
12 PM	1	125	24	0	5	1	0	2	0	0	0	0	0	158
13:00	3	105	24	1	3	0	0	0	1	0	0	0	0	137
14:00	2	125	24	2	6	0	0	3	0	0	0	0	0	162
15:00	4	146	30	0	7	0	0	2	0	0	0	0	0	189
16:00	3	180	37	0	6	0	0	1	0	0	0	0	0	227
17:00	0	197	23	0	1	0	0	1	0	0	0	0	0	222
18:00	1	156	22	0	2	0	0	1	0	0	0	0	0	182
19:00	1	145	12	0	3	0	0	1	0	0	0	0	0	162
20:00	0	133	15	0	3	0	1	0	0	0	0	0	0	152
21:00	0	84	8	0	0	0	0	0	0	0	0	0	0	92
22:00	0	53	8	0	1	0	0	1	0	0	0	0	0	63
23:00	0	35	7	0	3	1	0	0	0	0	0	0	0	46
Total	15	1981	375	6	68	3	1	20	2	0	0	0	0	2471
Percent	0.6%	80.2%	15.2%	0.2%	2.8%	0.1%	0.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	08:00	09:00	07:00	05:00		07:00	08:00					08:00
Vol.		101	34	2	8	1		4	1					131
PM Peak	15:00	17:00	16:00	14:00	15:00	12:00	20:00	14:00	13:00					16:00
Vol.	4	197	37	2	7	1	1	3	1					227
Grand Total	15	1981	375	6	68	3	1	20	2	0	0	0	0	2471
Percent	0.6%	80.2%	15.2%	0.2%	2.8%	0.1%	0.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
 Corona, CA 92878
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email: counts@countsunlimited.com

City of Chino Hills
 Butterfield Ranch Road
 E/ Twin Knolls Drive
 24 Hour Directional Classification Count

CHH003
 Site Code: 057-20438

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	41	10	0	0	0	0	0	0	0	0	0	0	51
01:00	0	24	4	0	1	0	0	0	0	0	0	0	0	29
02:00	0	18	3	0	0	0	0	0	0	0	0	0	0	21
03:00	0	19	4	0	0	0	0	0	0	0	0	0	0	23
04:00	1	34	5	0	1	0	0	0	0	0	0	0	0	41
05:00	1	72	17	0	6	1	0	0	0	0	0	0	0	97
06:00	1	130	38	0	6	0	0	1	0	0	0	0	0	176
07:00	3	199	59	1	16	0	0	5	0	0	0	0	0	283
08:00	3	239	60	1	9	1	0	3	1	0	0	0	0	317
09:00	0	205	44	3	12	0	0	2	0	0	0	0	0	266
10:00	0	197	61	2	14	0	0	2	0	0	0	0	0	276
11:00	1	199	44	0	8	0	0	0	0	0	0	0	0	252
12 PM	1	253	68	1	9	1	0	4	0	0	0	0	0	337
13:00	5	234	51	1	10	0	0	1	1	0	0	1	0	304
14:00	4	261	63	2	17	0	0	7	1	0	0	0	0	355
15:00	8	292	81	0	13	0	0	3	0	0	0	0	0	397
16:00	6	361	78	1	14	0	0	5	0	0	0	0	0	465
17:00	0	426	62	0	14	0	0	2	0	0	0	0	0	504
18:00	3	314	47	0	10	0	0	1	0	0	0	0	0	375
19:00	1	221	32	0	5	0	0	1	0	0	0	0	0	260
20:00	1	184	22	0	7	0	1	0	0	0	0	0	0	215
21:00	0	131	12	0	1	0	0	0	0	0	0	0	0	144
22:00	0	94	10	0	1	0	0	1	0	0	0	0	0	106
23:00	0	49	11	0	3	1	0	0	0	0	0	0	0	64
Total	39	4197	886	12	177	4	1	38	3	0	0	1	0	5358
Percent	0.7%	78.3%	16.5%	0.2%	3.3%	0.1%	0.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	08:00	10:00	09:00	07:00	05:00		07:00	08:00					08:00
Vol.	3	239	61	3	16	1		5	1					317
PM Peak	15:00	17:00	15:00	14:00	14:00	12:00	20:00	14:00	13:00			13:00		17:00
Vol.	8	426	81	2	17	1	1	7	1			1		504
Grand Total	39	4197	886	12	177	4	1	38	3	0	0	1	0	5358
Percent	0.7%	78.3%	16.5%	0.2%	3.3%	0.1%	0.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
 Butterfield Ranch Road
 W/ Twin Knolls Drive
 24 Hour Directional Classification Count

PO Box 1178
 Corona, CA 92878
 (951) 268-6268

email: counts@countsunlimited.com

CHH004
 Site Code: 057-20438

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	15	5	0	1	0	0	0	0	0	0	0	0	21
01:00	0	5	1	0	0	0	0	0	0	0	0	0	0	6
02:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
03:00	0	3	0	0	0	0	0	0	0	0	0	0	0	3
04:00	1	14	4	0	0	0	0	0	0	0	0	0	0	19
05:00	0	35	8	0	3	0	0	0	0	0	0	0	0	46
06:00	1	61	14	0	3	0	0	1	0	0	0	0	0	80
07:00	0	107	24	0	7	1	0	1	0	0	0	0	0	140
08:00	0	97	24	1	2	0	0	0	0	0	0	0	0	124
09:00	0	90	24	1	11	0	0	0	0	0	0	0	0	126
10:00	0	82	23	1	9	0	0	1	0	0	0	0	0	116
11:00	0	75	18	0	5	0	0	0	0	0	0	0	0	98
12 PM	1	107	34	1	3	0	0	2	0	0	0	0	0	148
13:00	1	103	28	0	8	1	0	1	0	0	0	0	0	142
14:00	1	125	33	1	15	0	0	4	0	0	0	0	0	179
15:00	4	156	41	0	8	0	0	1	0	0	0	0	0	210
16:00	2	178	39	1	9	0	0	3	0	0	0	0	0	232
17:00	0	233	46	0	10	0	0	0	0	0	0	0	0	289
18:00	1	123	27	0	8	0	0	0	0	0	0	0	0	159
19:00	0	68	13	0	1	0	0	0	0	1	0	0	0	83
20:00	0	48	5	0	2	0	0	0	0	0	0	0	0	55
21:00	0	35	5	0	0	0	0	0	0	0	0	0	0	40
22:00	0	31	4	0	0	0	0	0	0	0	0	0	0	35
23:00	0	11	4	0	1	0	0	0	0	0	0	0	0	16
Total	12	1808	426	6	107	2	0	14	0	1	0	0	0	2376
Percent	0.5%	76.1%	17.9%	0.3%	4.5%	0.1%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	04:00	07:00	07:00	08:00	09:00	07:00		06:00						07:00
Vol.	1	107	24	1	11	1		1						140
PM Peak	15:00	17:00	17:00	12:00	14:00	13:00		14:00		19:00				17:00
Vol.	4	233	46	1	15	1		4		1				289
Grand Total	12	1808	426	6	107	2	0	14	0	1	0	0	0	2376
Percent	0.5%	76.1%	17.9%	0.3%	4.5%	0.1%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
 Butterfield Ranch Road
 W/ Twin Knolls Drive
 24 Hour Directional Classification Count

PO Box 1178
 Corona, CA 92878
 (951) 268-6268
 email: counts@countsunlimited.com

CHH004
 Site Code: 057-20438

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	14	3	0	0	0	0	0	0	0	0	0	0	17
01:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
02:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
03:00	0	6	2	0	0	0	0	0	0	0	0	0	0	8
04:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
05:00	0	6	3	0	1	0	0	0	0	0	0	0	0	10
06:00	0	29	11	0	7	0	0	1	0	0	0	0	0	48
07:00	0	37	19	1	10	0	0	3	0	0	0	0	0	70
08:00	1	79	21	0	12	0	0	3	1	0	0	0	0	117
09:00	2	63	15	1	7	0	0	0	0	0	0	0	0	88
10:00	2	50	24	0	9	0	0	3	0	0	0	0	0	88
11:00	2	67	27	0	4	0	0	0	0	0	0	0	0	100
12 PM	0	88	25	1	8	0	0	2	0	1	0	0	0	125
13:00	1	82	25	1	4	0	0	0	1	0	0	0	0	114
14:00	3	100	24	2	8	0	0	2	0	0	0	0	0	139
15:00	2	102	29	0	9	1	0	4	0	0	0	0	0	147
16:00	2	139	35	0	10	0	0	0	0	0	0	0	0	186
17:00	0	142	38	0	3	0	0	0	0	0	0	0	0	183
18:00	0	91	24	0	5	1	0	0	0	0	0	0	0	121
19:00	1	90	18	0	5	0	0	0	0	0	0	0	0	114
20:00	0	79	13	0	4	0	0	0	0	0	0	0	0	96
21:00	0	51	5	0	1	0	0	0	0	0	0	0	0	57
22:00	1	33	8	0	5	0	0	0	0	0	0	0	0	47
23:00	0	27	6	0	2	0	0	0	0	0	0	0	0	35
Total	17	1395	376	6	115	2	0	18	2	1	0	0	0	1932
Percent	0.9%	72.2%	19.5%	0.3%	6.0%	0.1%	0.0%	0.9%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	11:00	07:00	08:00			07:00	08:00					08:00
Vol.	2	79	27	1	12			3	1					117
PM Peak	14:00	17:00	17:00	14:00	16:00	15:00		15:00	13:00	12:00				16:00
Vol.	3	142	38	2	10	1		4	1	1				186
Grand Total	17	1395	376	6	115	2	0	18	2	1	0	0	0	1932
Percent	0.9%	72.2%	19.5%	0.3%	6.0%	0.1%	0.0%	0.9%	0.1%	0.1%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
 Corona, CA 92878
 (951) 268-6268

email: counts@countsunlimited.com

City of Chino Hills
 Butterfield Ranch Road
 W/ Twin Knolls Drive
 24 Hour Directional Classification Count

CHH004
 Site Code: 057-20438

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	29	8	0	1	0	0	0	0	0	0	0	0	38
01:00	0	14	2	0	0	0	0	0	0	0	0	0	0	16
02:00	0	14	2	0	1	0	0	0	0	0	0	0	0	17
03:00	0	9	2	0	0	0	0	0	0	0	0	0	0	11
04:00	1	17	4	0	1	0	0	0	0	0	0	0	0	23
05:00	0	41	11	0	4	0	0	0	0	0	0	0	0	56
06:00	1	90	25	0	10	0	0	2	0	0	0	0	0	128
07:00	0	144	43	1	17	1	0	4	0	0	0	0	0	210
08:00	1	176	45	1	14	0	0	3	1	0	0	0	0	241
09:00	2	153	39	2	18	0	0	0	0	0	0	0	0	214
10:00	2	132	47	1	18	0	0	4	0	0	0	0	0	204
11:00	2	142	45	0	9	0	0	0	0	0	0	0	0	198
12 PM	1	195	59	2	11	0	0	4	0	1	0	0	0	273
13:00	2	185	53	1	12	1	0	1	1	0	0	0	0	256
14:00	4	225	57	3	23	0	0	6	0	0	0	0	0	318
15:00	6	258	70	0	17	1	0	5	0	0	0	0	0	357
16:00	4	317	74	1	19	0	0	3	0	0	0	0	0	418
17:00	0	375	84	0	13	0	0	0	0	0	0	0	0	472
18:00	1	214	51	0	13	1	0	0	0	0	0	0	0	280
19:00	1	158	31	0	6	0	0	0	0	1	0	0	0	197
20:00	0	127	18	0	6	0	0	0	0	0	0	0	0	151
21:00	0	86	10	0	1	0	0	0	0	0	0	0	0	97
22:00	1	64	12	0	5	0	0	0	0	0	0	0	0	82
23:00	0	38	10	0	3	0	0	0	0	0	0	0	0	51
Total	29	3203	802	12	222	4	0	32	2	2	0	0	0	4308
Percent	0.7%	74.4%	18.6%	0.3%	5.2%	0.1%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	10:00	09:00	09:00	07:00		07:00	08:00					08:00
Vol.	2	176	47	2	18	1		4	1					241
PM Peak	15:00	17:00	17:00	14:00	14:00	13:00		14:00	13:00	12:00				17:00
Vol.	6	375	84	3	23	1		6	1	1				472
Grand Total	29	3203	802	12	222	4	0	32	2	2	0	0	0	4308
Percent	0.7%	74.4%	18.6%	0.3%	5.2%	0.1%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
Twin Knolls Drive
S/ Butterfield Ranch Road
24 Hour Directional Classification Count

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

CHH002
Site Code: 057-20438

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	4	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
04:00	0	6	0	0	1	0	0	0	0	0	0	0	0	7
05:00	0	13	3	0	0	0	0	0	0	0	0	0	0	16
06:00	0	26	5	0	1	0	0	0	0	0	0	0	0	32
07:00	0	36	4	0	0	0	0	0	0	0	0	0	0	40
08:00	1	51	4	1	0	0	0	0	0	0	0	0	0	57
09:00	0	25	2	0	1	0	0	0	0	0	0	0	0	28
10:00	0	24	3	1	1	0	0	0	0	0	0	0	0	29
11:00	0	28	6	0	2	0	0	0	0	0	0	0	0	36
12 PM	0	28	7	0	1	0	0	0	0	0	0	0	0	36
13:00	0	35	2	0	2	0	0	0	0	0	0	0	0	39
14:00	0	30	5	0	1	0	0	1	0	0	0	0	0	37
15:00	0	23	3	0	0	0	0	0	0	0	0	0	0	26
16:00	0	31	5	0	0	0	0	0	0	0	0	0	0	36
17:00	2	42	4	0	1	0	0	0	0	0	0	0	0	49
18:00	2	29	4	0	0	0	0	0	0	0	0	0	0	35
19:00	0	18	3	0	1	0	0	0	0	0	0	0	0	22
20:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
21:00	0	17	0	0	0	0	0	0	0	0	0	0	0	17
22:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
23:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
Total	5	501	61	2	12	0	0	1	0	0	0	0	0	582
Percent	0.9%	86.1%	10.5%	0.3%	2.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	11:00	08:00	11:00									08:00
Vol.	1	51	6	1	2									57
PM Peak	17:00	17:00	12:00		13:00			14:00						17:00
Vol.	2	42	7		2			1						49
Grand Total	5	501	61	2	12	0	0	1	0	0	0	0	0	582
Percent	0.9%	86.1%	10.5%	0.3%	2.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
 Twin Knolls Drive
 S/ Butterfield Ranch Road
 24 Hour Directional Classification Count

PO Box 1178
 Corona, CA 92878
 (951) 268-6268

email: counts@countsunlimited.com

CHH002
 Site Code: 057-20438

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	5	2	0	0	0	0	0	0	0	0	0	0	7
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	8	1	0	0	1	0	0	0	0	0	0	0	10
06:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
07:00	0	13	3	0	1	0	0	0	0	0	0	0	0	17
08:00	0	18	7	1	0	0	0	0	0	0	0	0	0	26
09:00	0	21	3	0	0	0	0	0	0	0	0	0	0	24
10:00	0	22	2	0	0	0	0	0	0	0	0	0	0	24
11:00	0	25	1	0	1	0	0	0	0	0	0	0	0	27
12 PM	0	26	7	0	2	0	0	0	0	0	0	0	0	35
13:00	0	31	5	0	0	0	0	0	0	0	0	0	0	36
14:00	0	39	10	0	2	0	0	0	0	0	0	0	0	51
15:00	1	55	10	0	3	0	0	0	0	0	0	0	0	69
16:00	0	41	7	0	0	0	0	0	0	0	0	0	0	48
17:00	1	67	7	0	0	0	0	0	0	0	0	0	0	75
18:00	0	59	5	0	0	0	0	0	0	0	0	0	0	64
19:00	0	39	3	0	0	0	0	0	0	0	0	0	0	42
20:00	0	42	1	0	0	0	0	0	0	0	0	0	0	43
21:00	0	27	3	0	0	0	0	0	0	0	0	0	0	30
22:00	0	15	1	0	0	0	0	0	0	0	0	0	0	16
23:00	0	6	2	0	1	0	0	0	0	0	0	0	0	9
Total	2	569	82	1	10	1	0	0	0	0	0	0	0	665
Percent	0.3%	85.6%	12.3%	0.2%	1.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	08:00	08:00	07:00	05:00								11:00
Vol.		25	7	1	1	1								27
PM Peak	15:00	17:00	14:00		15:00									17:00
Vol.	1	67	10		3									75
Grand Total	2	569	82	1	10	1	0	0	0	0	0	0	0	665
Percent	0.3%	85.6%	12.3%	0.2%	1.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
Twin Knolls Drive
S/ Butterfield Ranch Road
24 Hour Directional Classification Count

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

CHH002
Site Code: 057-20438

Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/19/20	0	9	2	0	0	0	0	0	0	0	0	0	0	11
01:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
04:00	0	7	0	0	1	0	0	0	0	0	0	0	0	8
05:00	0	21	4	0	0	1	0	0	0	0	0	0	0	26
06:00	0	32	6	0	1	0	0	0	0	0	0	0	0	39
07:00	0	49	7	0	1	0	0	0	0	0	0	0	0	57
08:00	1	69	11	2	0	0	0	0	0	0	0	0	0	83
09:00	0	46	5	0	1	0	0	0	0	0	0	0	0	52
10:00	0	46	5	1	1	0	0	0	0	0	0	0	0	53
11:00	0	53	7	0	3	0	0	0	0	0	0	0	0	63
12 PM	0	54	14	0	3	0	0	0	0	0	0	0	0	71
13:00	0	66	7	0	2	0	0	0	0	0	0	0	0	75
14:00	0	69	15	0	3	0	0	1	0	0	0	0	0	88
15:00	1	78	13	0	3	0	0	0	0	0	0	0	0	95
16:00	0	72	12	0	0	0	0	0	0	0	0	0	0	84
17:00	3	109	11	0	1	0	0	0	0	0	0	0	0	124
18:00	2	88	9	0	0	0	0	0	0	0	0	0	0	99
19:00	0	57	6	0	1	0	0	0	0	0	0	0	0	64
20:00	0	57	2	0	0	0	0	0	0	0	0	0	0	59
21:00	0	44	3	0	0	0	0	0	0	0	0	0	0	47
22:00	0	22	1	0	0	0	0	0	0	0	0	0	0	23
23:00	0	8	2	0	1	0	0	0	0	0	0	0	0	11
Total	7	1070	143	3	22	1	0	1	0	0	0	0	0	1247
Percent	0.6%	85.8%	11.5%	0.2%	1.8%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	08:00	08:00	08:00	11:00	05:00								08:00
Vol.	1	69	11	2	3	1								83
PM Peak	17:00	17:00	14:00		12:00			14:00						17:00
Vol.	3	109	15		3			1						124
Grand Total	7	1070	143	3	22	1	0	1	0	0	0	0	0	1247
Percent	0.6%	85.8%	11.5%	0.2%	1.8%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

City of Chino Hills
 Via La Cresta
 B/ Twin Knolls Drive - Mystic Canyon Drive
 24 Hour Directional Speed Survey

PO Box 1178
 Corona, CA 92878
 (951) 268-6268
 email: counts@countsunlimited.com

CHH001S
 Site Code: 057-20438

Eastbound

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
11/19/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
06:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	1	2	2	0	0	0	0	0	0	0	0	0	0	5
09:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2
10:00	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
11:00	2	2	4	4	0	1	0	0	0	0	0	0	0	0	13
12 PM	3	1	2	0	0	0	0	0	0	0	0	0	0	0	6
13:00	2	1	0	3	0	0	0	0	0	0	0	0	0	0	6
14:00	3	0	1	1	0	0	0	0	0	0	0	0	0	0	5
15:00	3	1	3	5	0	0	0	0	0	0	0	0	0	0	12
16:00	4	4	0	3	0	0	0	0	0	0	0	0	0	0	11
17:00	5	6	2	1	0	0	0	0	0	0	0	0	0	0	14
18:00	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3
19:00	0	1	2	2	2	0	0	0	0	0	0	0	0	0	7
20:00	1	3	0	0	0	0	0	0	0	0	0	0	0	0	4
21:00	1	1	1	1	0	0	0	0	0	0	0	0	0	0	4
22:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	26	25	23	26	3	1	0	0	0	0	0	0	0	0	104

Daily
 15th Percentile : 8 MPH
 50th Percentile : 20 MPH
 85th Percentile : 27 MPH
 95th Percentile : 29 MPH

Statistics
 Mean Speed(Average) : 20 MPH
 10 MPH Pace Speed : 21-30 MPH
 Number in Pace : 49
 Percent in Pace : 47.1%
 Number of Vehicles > 55 MPH : 0
 Percent of Vehicles > 55 MPH : 0.0%

Counts Unlimited, Inc.

City of Chino Hills
 Via La Cresta
 B/ Twin Knolls Drive - Mystic Canyon Drive
 24 Hour Directional Speed Survey

PO Box 1178
 Corona, CA 92878
 (951) 268-6268
 email: counts@countsunlimited.com

CHH001S
 Site Code: 057-20438

Westbound

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
11/19/20	1	0	1	1	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
06:00	0	1	0	1	1	0	0	0	0	0	0	0	0	0	3
07:00	1	3	0	0	0	0	0	0	0	0	0	0	0	0	4
08:00	1	2	2	2	0	0	0	0	0	0	0	0	0	0	7
09:00	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3
10:00	1	0	2	2	0	0	0	0	0	0	0	0	0	0	5
11:00	3	1	2	1	0	0	0	0	0	0	0	0	0	0	7
12 PM	3	0	2	2	0	0	0	0	0	0	0	0	0	0	7
13:00	0	1	3	1	0	0	0	0	0	0	0	0	0	0	5
14:00	2	1	1	0	1	0	0	0	0	0	0	0	0	0	5
15:00	3	1	2	1	0	0	0	0	0	0	0	0	0	0	7
16:00	3	3	2	3	0	0	0	0	0	0	0	0	0	0	11
17:00	2	0	3	1	1	0	0	0	0	0	0	0	0	0	7
18:00	1	2	1	0	0	0	0	0	0	0	0	0	0	0	4
19:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
20:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
21:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
22:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	25	17	26	17	3	0	0	0	0	0	0	0	0	0	88

Daily
 15th Percentile : 7 MPH
 50th Percentile : 20 MPH
 85th Percentile : 27 MPH
 95th Percentile : 29 MPH

Statistics
 Mean Speed(Average) : 19 MPH
 10 MPH Pace Speed : 21-30 MPH
 Number in Pace : 43
 Percent in Pace : 48.9%
 Number of Vehicles > 55 MPH : 0
 Percent of Vehicles > 55 MPH : 0.0%

Counts Unlimited, Inc.

City of Chino Hills
 Via La Cresta
 B/ Twin Knolls Drive - Mystic Canyon Drive
 24 Hour Directional Speed Survey

PO Box 1178
 Corona, CA 92878
 (951) 268-6268
 email: counts@countsunlimited.com

CHH001S
 Site Code: 057-20438

Eastbound, Westbound

Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	999	Total
11/19/20	1	0	1	1	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
06:00	1	1	0	2	1	0	0	0	0	0	0	0	0	0	5
07:00	1	3	0	0	0	0	0	0	0	0	0	0	0	0	4
08:00	1	3	4	4	0	0	0	0	0	0	0	0	0	0	12
09:00	0	0	2	2	1	0	0	0	0	0	0	0	0	0	5
10:00	2	0	2	4	0	0	0	0	0	0	0	0	0	0	8
11:00	5	3	6	5	0	1	0	0	0	0	0	0	0	0	20
12 PM	6	1	4	2	0	0	0	0	0	0	0	0	0	0	13
13:00	2	2	3	4	0	0	0	0	0	0	0	0	0	0	11
14:00	5	1	2	1	1	0	0	0	0	0	0	0	0	0	10
15:00	6	2	5	6	0	0	0	0	0	0	0	0	0	0	19
16:00	7	7	2	6	0	0	0	0	0	0	0	0	0	0	22
17:00	7	6	5	2	1	0	0	0	0	0	0	0	0	0	21
18:00	1	2	3	1	0	0	0	0	0	0	0	0	0	0	7
19:00	2	1	2	2	2	0	0	0	0	0	0	0	0	0	9
20:00	1	4	2	0	0	0	0	0	0	0	0	0	0	0	7
21:00	2	1	1	1	0	0	0	0	0	0	0	0	0	0	5
22:00	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	51	42	49	43	6	1	0	0	0	0	0	0	0	0	192

Daily
 15th Percentile : 8 MPH
 50th Percentile : 20 MPH
 85th Percentile : 27 MPH
 95th Percentile : 29 MPH

Statistics
 Mean Speed(Average) : 19 MPH
 10 MPH Pace Speed : 19-28 MPH
 Number in Pace : 92
 Percent in Pace : 47.9%
 Number of Vehicles > 55 MPH : 0
 Percent of Vehicles > 55 MPH : 0.0%

APPENDIX B-IV

HISTORIC COUNTS

ITM Peak Hour Summary

Prepared by:



National Data & Surveying Services

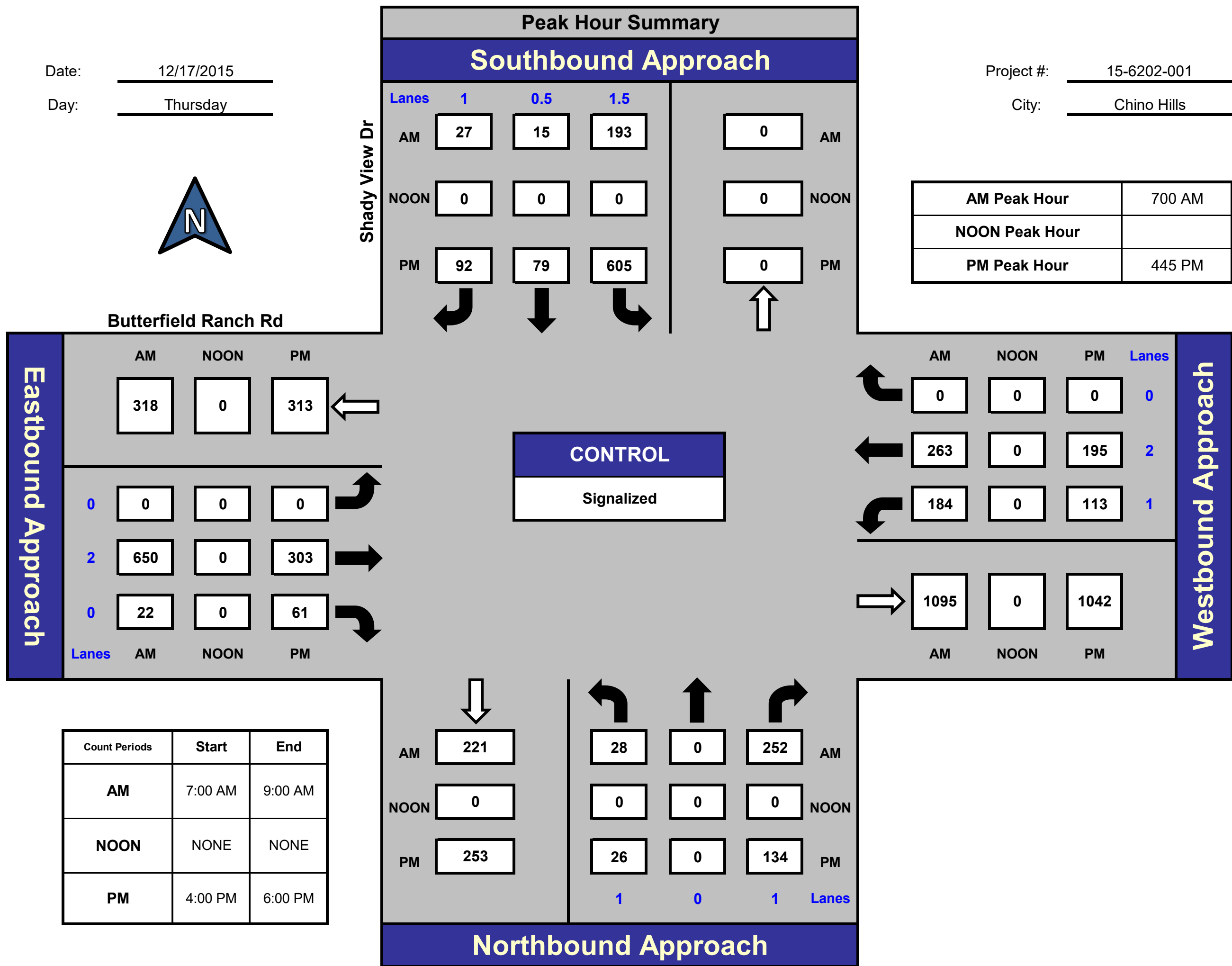
Shady View Dr and Butterfield Ranch Rd, Chino Hills

Date: 12/17/2015

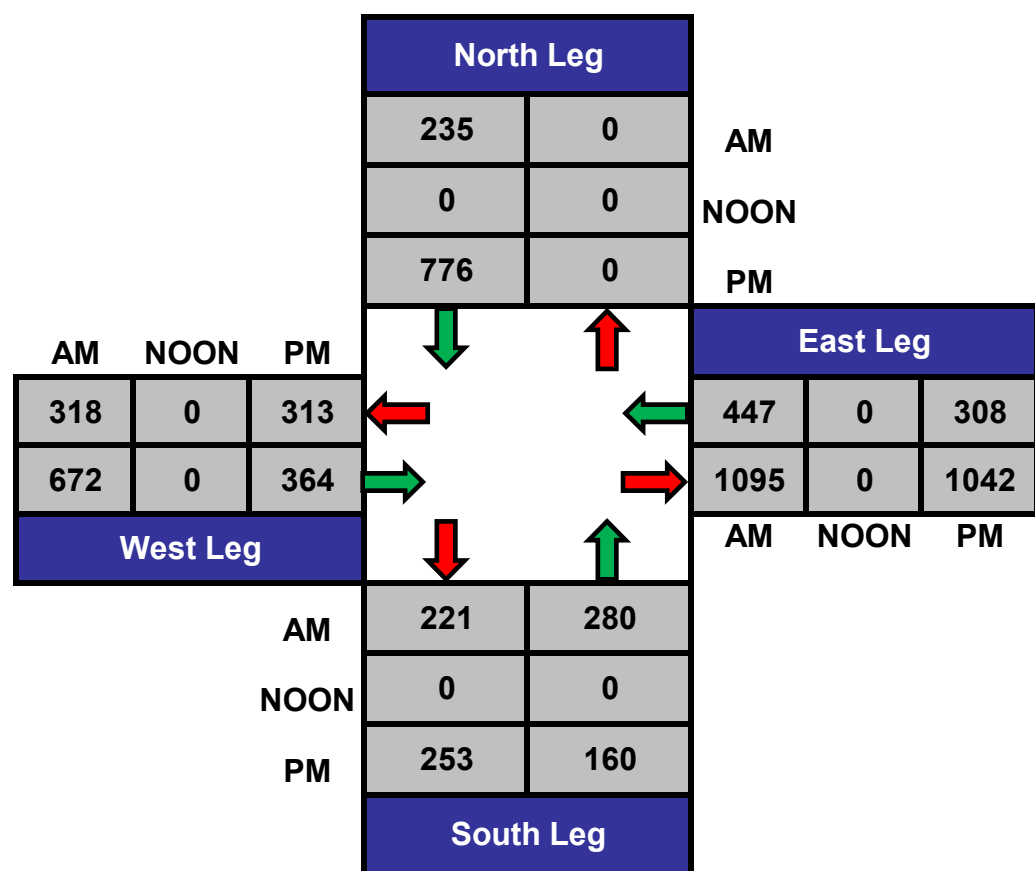
Day: Thursday

Project #: 15-6202-001

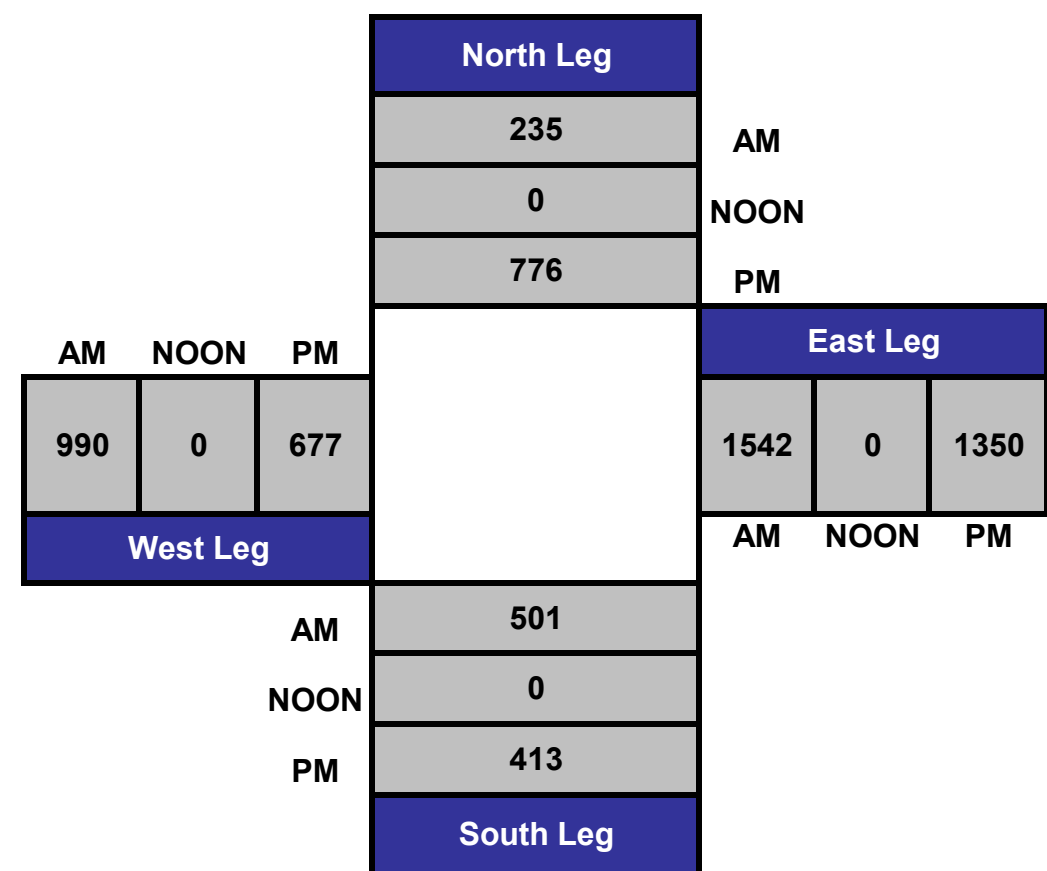
City: Chino Hills



Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

Day: Thursday

Date: 12/17/2015

TOTALS

AM

NS/EW Streets:	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			TOTAL
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
7:00 AM	6	0	77	47	1	5	0	176	5	48	76	0	441
7:15 AM	10	0	61	39	5	4	0	189	1	49	82	0	440
7:30 AM	6	0	62	63	7	9	0	143	10	43	48	0	391
7:45 AM	6	0	52	44	2	9	0	142	6	44	57	0	362
8:00 AM	7	0	56	42	4	7	0	108	7	59	28	0	318
8:15 AM	7	0	53	37	20	10	0	119	20	47	56	0	369
8:30 AM	16	0	74	26	9	12	0	106	14	25	28	0	310
8:45 AM	1	0	42	37	13	7	0	97	3	10	51	0	261
TOTAL VOLUMES :	59	0	477	335	61	63	0	1080	66	325	426	0	2892
APPROACH %'s :	11.01%	0.00%	88.99%	72.98%	13.29%	13.73%	0.00%	94.24%	5.76%	43.28%	56.72%	0.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	28	0	252	193	15	27	0	650	22	184	263	0	1634
PEAK HR FACTOR :	0.843			0.744			0.884			0.853			0.926

UTURNS			
NB	SB	EB	WB
			46
			47
			39
			38
			46
			16
			13
			7
NB	SB	EB	WB
0	0	0	252

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

Day: Thursday

Date: 12/17/2015

TOTALS

PM

NS/EW Streets:	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			TOTAL
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
4:00 PM	3	0	23	147	36	28	0	62	12	17	48	0	376
4:15 PM	2	0	28	146	23	33	0	59	7	9	34	0	341
4:30 PM	9	0	23	130	20	27	0	62	9	13	45	0	338
4:45 PM	7	0	29	186	27	34	0	55	10	33	44	0	425
5:00 PM	6	0	33	154	29	24	0	76	7	22	66	0	417
5:15 PM	5	0	38	145	12	21	0	82	21	34	39	0	397
5:30 PM	8	0	34	120	11	13	0	90	23	24	46	0	369
5:45 PM	2	0	35	131	8	18	0	87	16	20	52	0	369
TOTAL VOLUMES :	42	0	243	1159	166	198	0	573	105	172	374	0	3032
APPROACH %'s :	14.74%	0.00%	85.26%	76.10%	10.90%	13.00%	0.00%	84.51%	15.49%	31.50%	68.50%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	26	0	134	605	79	92	0	303	61	113	195	0	1608
PEAK HR FACTOR :	0.930			0.785			0.805			0.875			0.946

UTURNS			
NB	SB	EB	WB
			3
			0
			1
			9
			6
			12
			3
			4
NB	SB	EB	WB
0	0	0	38

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

Cars

Day: Thursday

Date: 12/17/2015

AM

NS/EW Streets:	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			TOTAL
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
7:00 AM	5	0	77	44	1	5	0	172	5	48	75	0	432
7:15 AM	10	0	61	34	5	4	0	188	1	49	80	0	432
7:30 AM	5	0	61	58	7	9	0	141	10	43	47	0	381
7:45 AM	6	0	52	42	2	8	0	141	6	44	53	0	354
8:00 AM	7	0	55	41	3	7	0	108	7	59	25	0	312
8:15 AM	7	0	53	32	20	10	0	119	20	47	53	0	361
8:30 AM	15	0	74	25	9	11	0	103	14	25	27	0	303
8:45 AM	1	0	42	33	13	7	0	96	3	9	50	0	254
TOTAL VOLUMES :	56	0	475	309	60	61	0	1068	66	324	410	0	2829
APPROACH %'s :	10.55%	0.00%	89.45%	71.86%	13.95%	14.19%	0.00%	94.18%	5.82%	44.14%	55.86%	0.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	26	0	251	178	15	26	0	642	22	184	255	0	1599
PEAK HR FACTOR :	0.845			0.740			0.878			0.851			0.925

UTURNS			
NB	SB	EB	WB
			46
			47
			39
			38
			46
			16
			13
			7
NB	SB	EB	WB
0	0	0	252

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

Cars

Day: Thursday

Date: 12/17/2015

PM

NS/EW Streets:	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			TOTAL
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
4:00 PM	3	0	23	144	35	26	0	60	12	17	47	0	367
4:15 PM	2	0	28	144	23	33	0	59	7	9	34	0	339
4:30 PM	9	0	22	127	20	27	0	61	9	13	45	0	333
4:45 PM	7	0	29	180	27	34	0	55	10	33	44	0	419
5:00 PM	6	0	33	152	29	24	0	76	7	22	65	0	414
5:15 PM	5	0	38	142	12	21	0	82	20	34	39	0	393
5:30 PM	7	0	34	117	11	13	0	88	23	24	46	0	363
5:45 PM	2	0	35	128	8	17	0	87	16	20	52	0	365
TOTAL VOLUMES :	41	0	242	1134	165	195	0	568	104	172	372	0	2993
APPROACH %'s :	14.49%	0.00%	85.51%	75.90%	11.04%	13.05%	0.00%	84.52%	15.48%	31.62%	68.38%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	25	0	134	591	79	92	0	301	60	113	194	0	1589
PEAK HR FACTOR :	0.924			0.790			0.813			0.882			0.948

UTURNS			
NB	SB	EB	WB
			3
			0
			1
			9
			6
			12
			3
			4
NB	SB	EB	WB
0	0	0	38

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

2 Axle Trucks

Day: Thursday

Date: 12/17/2015

NS/EW Streets:	AM												TOTAL
	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
7:00 AM	1	0	0	1	0	0	0	3	0	0	1	0	6
7:15 AM	0	0	0	1	0	0	0	1	0	0	2	0	4
7:30 AM	1	0	1	2	0	0	0	1	0	0	1	0	6
7:45 AM	0	0	0	0	0	1	0	1	0	0	3	0	5
8:00 AM	0	0	1	0	1	0	0	0	0	0	3	0	5
8:15 AM	0	0	0	2	0	0	0	0	0	0	2	0	4
8:30 AM	1	0	0	0	0	1	0	2	0	0	1	0	5
8:45 AM	0	0	0	1	0	0	0	1	0	1	1	0	4
TOTAL VOLUMES :	3	0	2	7	1	2	0	9	0	1	14	0	39
APPROACH %'s :	60.00%	0.00%	40.00%	70.00%	10.00%	20.00%	0.00%	100.00%	0.00%	6.67%	93.33%	0.00%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	2	0	1	4	0	1	0	6	0	0	7	0	21
PEAK HR FACTOR :	0.375			0.625			0.500			0.583			0.925

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

2 Axle Trucks

Day: Thursday

Date: 12/17/2015

NS/EW Streets:	PM												TOTAL
	Shady View Dr NORTHBOUND			Shady View Dr SOUTHBOUND			Butterfield Ranch Rd EASTBOUND			Butterfield Ranch Rd WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
4:00 PM	0	0	0	2	1	0	0	1	0	0	1	0	5
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	1	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1
5:15 PM	0	0	0	1	0	0	0	0	1	0	0	0	2
5:30 PM	1	0	0	1	0	0	0	2	0	0	0	0	4
5:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	1	0	1	6	1	1	0	3	1	0	2	0	16
	50.00%	0.00%	50.00%	75.00%	12.50%	12.50%	0.00%	75.00%	25.00%	0.00%	100.00%	0.00%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	1	0	0	3	0	0	0	2	1	0	1	0	8
PEAK HR FACTOR :	0.250			0.750			0.375			0.250			0.948

UTURNS			
NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

3 Axle Trucks

Day: Thursday

Date: 12/17/2015

NS/EW Streets:	AM												TOTAL
	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1
8:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	
	0	0	0	4	0	0	0	2	0	0	1	0	7
PEAK HR START TIME :	7:00 AM												TOTAL
PEAK HR VOL :	0	0	0	1	0	0	0	1	0	0	0	0	2
PEAK HR FACTOR :	0.000			0.250			0.250			0.000			0.925

UTURNS			
NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

3 Axle Trucks

Day: Thursday

Date: 12/17/2015

NS/EW Streets:	PM												TOTAL
	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
4:00 PM	0	0	0	0	0	2	0	1	0	0	0	0	3
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	1	0	0	0	1	0	0	0	0	2
4:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	71.43%	0.00%	28.57%	0.00%	100.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	9
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	2	0	0	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000			0.250			0.000			0.000			0.948

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

4 Axle+ Trucks

Day: Thursday

Date: 12/17/2015

NS/EW Streets:	AM												TOTAL
	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
7:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	3	0	0	0	0	0	0	0	0	3
7:30 AM	0	0	0	3	0	0	0	1	0	0	0	0	4
7:45 AM	0	0	0	2	0	0	0	0	0	0	1	0	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	3	0	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	1
TOTAL VOLUMES :	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	17
PEAK HR START TIME :	7:00 AM												TOTAL
PEAK HR VOL :	0	0	0	10	0	0	0	1	0	0	1	0	12
PEAK HR FACTOR :	0.000			0.833			0.250			0.250			0.925

UTURNS			
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 15-6202-001

City: Chino Hills

4 Axle+ Trucks

Day: Thursday

Date: 12/17/2015

NS/EW Streets:	PM												TOTAL
	Shady View Dr			Shady View Dr			Butterfield Ranch Rd			Butterfield Ranch Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	0	1	1.5	0.5	1	0	2	0	1	2	0	
4:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	3	0	0	0	0	0	0	0	0	3
5:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES :	0	0	0	14	0	0	0	0	0	0	0	0	14
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	100.00%	0.00%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	0	0	0	9	0	0	0	0	0	0	0	0	9
PEAK HR FACTOR :	0.000			0.750			0.000			0.000			0.948

UTURNS			
NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

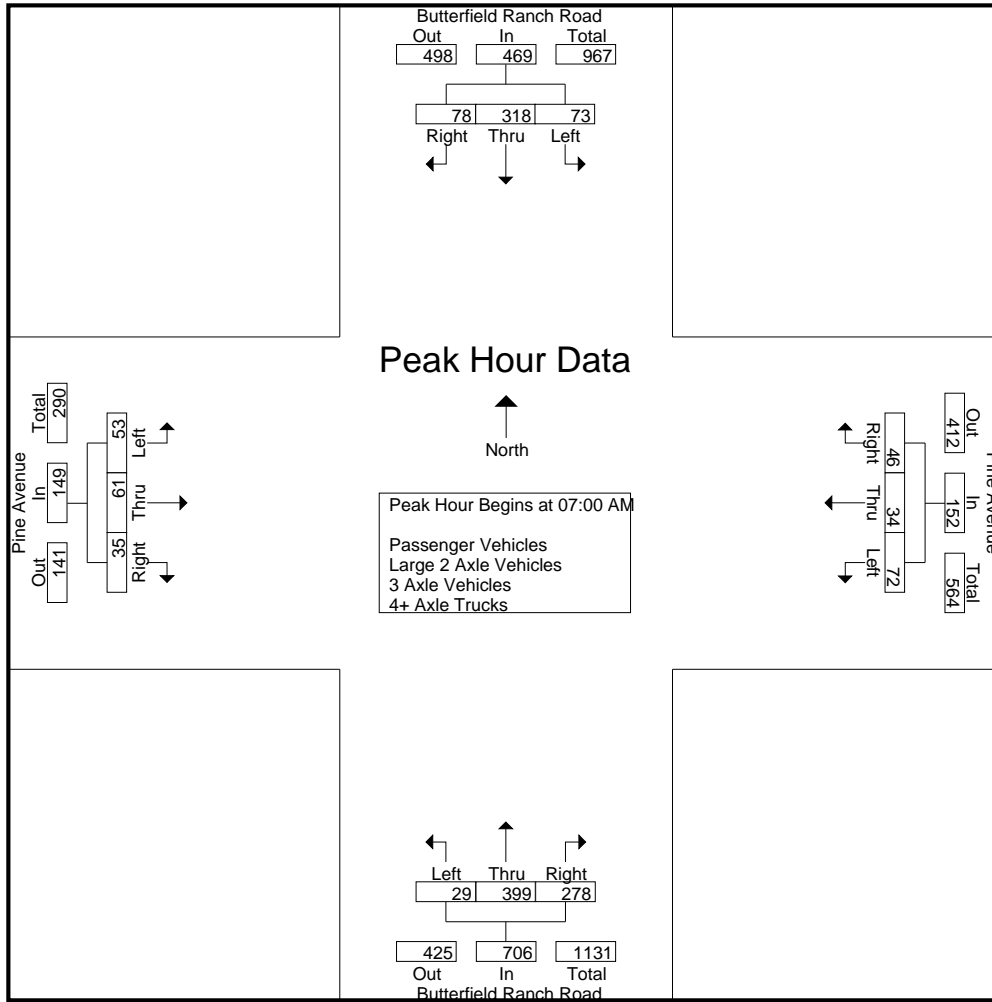
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	28	83	1	112	24	7	10	41	1	154	81	236	3	20	6	29	418
07:15 AM	21	112	2	135	24	2	22	48	6	138	95	239	2	19	4	25	447
07:30 AM	15	85	3	103	23	5	9	37	1	41	101	143	2	17	6	25	308
07:45 AM	9	38	72	119	1	20	5	26	21	66	1	88	46	5	19	70	303
Total	73	318	78	469	72	34	46	152	29	399	278	706	53	61	35	149	1476
08:00 AM	5	35	51	91	0	10	5	15	11	54	2	67	40	3	9	52	225
08:15 AM	5	69	55	129	0	10	3	13	12	83	0	95	37	0	12	49	286
08:30 AM	4	54	78	136	1	10	6	17	6	61	0	67	22	3	9	34	254
08:45 AM	4	45	53	102	0	16	5	21	11	53	3	67	16	2	21	39	229
Total	18	203	237	458	1	46	19	66	40	251	5	296	115	8	51	174	994
Grand Total	91	521	315	927	73	80	65	218	69	650	283	1002	168	69	86	323	2470
Apprch %	9.8	56.2	34		33.5	36.7	29.8		6.9	64.9	28.2		52	21.4	26.6		
Total %	3.7	21.1	12.8	37.5	3	3.2	2.6	8.8	2.8	26.3	11.5	40.6	6.8	2.8	3.5	13.1	
Passenger Vehicles	87	507	312	906	71	79	63	213	69	635	276	980	164	68	83	315	2414
% Passenger Vehicles	95.6	97.3	99	97.7	97.3	98.8	96.9	97.7	100	97.7	97.5	97.8	97.6	98.6	96.5	97.5	97.7
Large 2 Axle Vehicles	4	14	3	21	2	0	2	4	0	15	7	22	4	0	3	7	54
% Large 2 Axle Vehicles	4.4	2.7	1	2.3	2.7	0	3.1	1.8	0	2.3	2.5	2.2	2.4	0	3.5	2.2	2.2
3 Axle Vehicles	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% 3 Axle Vehicles	0	0	0	0	0	1.2	0	0.5	0	0	0	0	0	1.4	0	0.3	0.1
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	28	83	1	112	24	7	10	41	1	154	81	236	3	20	6	29	418
07:15 AM	21	112	2	135	24	2	22	48	6	138	95	239	2	19	4	25	447
07:30 AM	15	85	3	103	23	5	9	37	1	41	101	143	2	17	6	25	308
07:45 AM	9	38	72	119	1	20	5	26	21	66	1	88	46	5	19	70	303
Total Volume	73	318	78	469	72	34	46	152	29	399	278	706	53	61	35	149	1476
% App. Total	15.6	67.8	16.6		47.4	22.4	30.3		4.1	56.5	39.4		35.6	40.9	23.5		
PHF	.652	.710	.271	.869	.750	.425	.523	.792	.345	.648	.688	.738	.288	.763	.461	.532	.826

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	9	38	72	119	24	7	10	41	1	154	81	236	46	19	70	
+15 mins.	5	35	51	91	24	2	22	48	6	138	95	239	40	3	52	
+30 mins.	5	69	55	129	23	5	9	37	1	41	101	143	37	0	49	
+45 mins.	4	54	78	136	1	20	5	26	21	66	1	88	22	3	34	
Total Volume	23	196	256	475	72	34	46	152	29	399	278	706	145	11	205	
% App. Total	4.8	41.3	53.9		47.4	22.4	30.3		4.1	56.5	39.4		70.7	5.4	23.9	
PHF	.639	.710	.821	.873	.750	.425	.523	.792	.345	.648	.688	.738	.788	.550	.645	

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

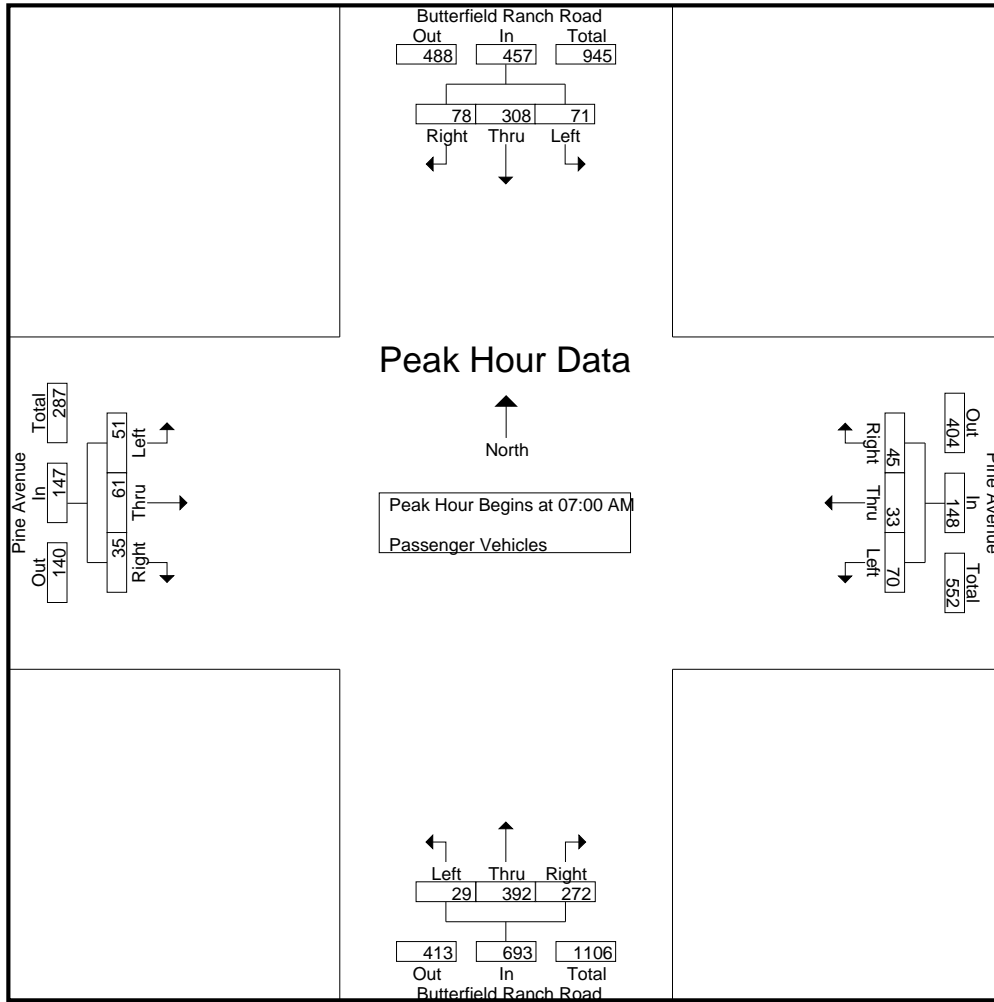
Groups Printed- Passenger Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	27	78	1	106	23	6	10	39	1	151	81	233	3	20	6	29	407
07:15 AM	20	110	2	132	23	2	21	46	6	137	90	233	2	19	4	25	436
07:30 AM	15	84	3	102	23	5	9	37	1	39	101	141	2	17	6	25	305
07:45 AM	9	36	72	117	1	20	5	26	21	65	0	86	44	5	19	68	297
Total	71	308	78	457	70	33	45	148	29	392	272	693	51	61	35	147	1445
08:00 AM	4	35	51	90	0	10	5	15	11	49	1	61	39	3	7	49	215
08:15 AM	5	67	55	127	0	10	3	13	12	81	0	93	36	0	11	47	280
08:30 AM	4	53	78	135	1	10	6	17	6	61	0	67	22	2	9	33	252
08:45 AM	3	44	50	97	0	16	4	20	11	52	3	66	16	2	21	39	222
Total	16	199	234	449	1	46	18	65	40	243	4	287	113	7	48	168	969
Grand Total	87	507	312	906	71	79	63	213	69	635	276	980	164	68	83	315	2414
Apprch %	9.6	56	34.4		33.3	37.1	29.6		7	64.8	28.2		52.1	21.6	26.3		
Total %	3.6	21	12.9	37.5	2.9	3.3	2.6	8.8	2.9	26.3	11.4	40.6	6.8	2.8	3.4	13	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	27	78	1	106	23	6	10	39	1	151	81	233	3	20	6	29	407
07:15 AM	20	110	2	132	23	2	21	46	6	137	90	233	2	19	4	25	436
07:30 AM	15	84	3	102	23	5	9	37	1	39	101	141	2	17	6	25	305
07:45 AM	9	36	72	117	1	20	5	26	21	65	0	86	44	5	19	68	297
Total Volume	71	308	78	457	70	33	45	148	29	392	272	693	51	61	35	147	1445
% App. Total	15.5	67.4	17.1		47.3	22.3	30.4		4.2	56.6	39.2		34.7	41.5	23.8		
PHF	.657	.700	.271	.866	.761	.413	.536	.804	.345	.649	.673	.744	.290	.763	.461	.540	.829

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	27	78	1	106	23	6	10	39	1	151	81	233	3	20	6	29
+15 mins.	20	110	2	132	23	2	21	46	6	137	90	233	2	19	4	25
+30 mins.	15	84	3	102	23	5	9	37	1	39	101	141	2	17	6	25
+45 mins.	9	36	72	117	1	20	5	26	21	65	0	86	44	5	19	68
Total Volume	71	308	78	457	70	33	45	148	29	392	272	693	51	61	35	147
% App. Total	15.5	67.4	17.1		47.3	22.3	30.4		4.2	56.6	39.2		34.7	41.5	23.8	
PHF	.657	.700	.271	.866	.761	.413	.536	.804	.345	.649	.673	.744	.290	.763	.461	.540

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

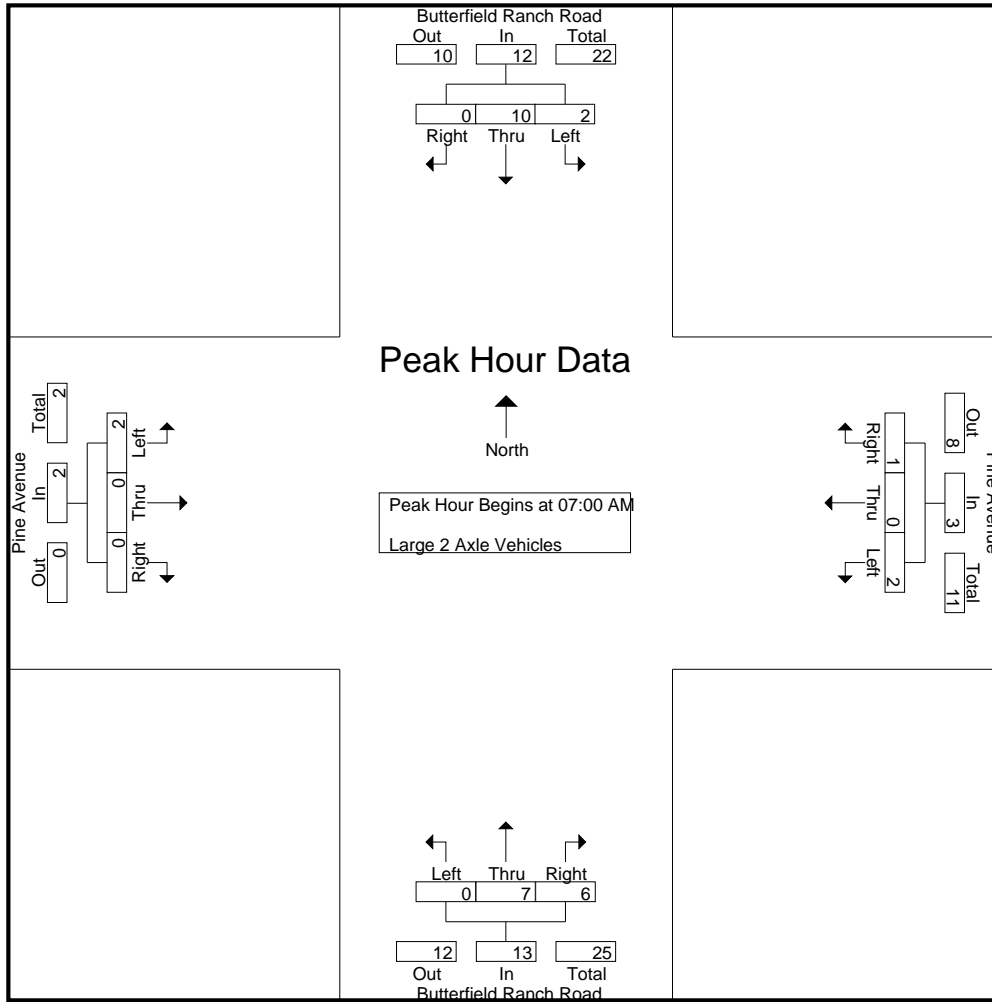
Groups Printed- Large 2 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	1	5	0	6	1	0	0	1	0	3	0	3	0	0	0	0	10
07:15 AM	1	2	0	3	1	0	1	2	0	1	5	6	0	0	0	0	11
07:30 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
07:45 AM	0	2	0	2	0	0	0	0	0	1	1	2	2	0	0	2	6
Total	2	10	0	12	2	0	1	3	0	7	6	13	2	0	0	2	30
08:00 AM	1	0	0	1	0	0	0	0	0	5	1	6	1	0	2	3	10
08:15 AM	0	2	0	2	0	0	0	0	0	2	0	2	1	0	1	2	6
08:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	1	1	3	5	0	0	1	1	0	1	0	1	0	0	0	0	7
Total	2	4	3	9	0	0	1	1	0	8	1	9	2	0	3	5	24
Grand Total	4	14	3	21	2	0	2	4	0	15	7	22	4	0	3	7	54
Apprch %	19	66.7	14.3		50	0	50		0	68.2	31.8		57.1	0	42.9		
Total %	7.4	25.9	5.6	38.9	3.7	0	3.7	7.4	0	27.8	13	40.7	7.4	0	5.6	13	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	1	5	0	6	1	0	0	1	0	3	0	3	0	0	0	0	10
07:15 AM	1	2	0	3	1	0	1	2	0	1	5	6	0	0	0	0	11
07:30 AM	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
07:45 AM	0	2	0	2	0	0	0	0	0	1	1	2	2	0	0	2	6
Total Volume	2	10	0	12	2	0	1	3	0	7	6	13	2	0	0	2	30
% App. Total	16.7	83.3	0		66.7	0	33.3		0	53.8	46.2		100	0	0		
PHF	.500	.500	.000	.500	.500	.000	.250	.375	.000	.583	.300	.542	.250	.000	.000	.250	.682

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	1	5	0	6	1	0	0	1	0	3	0	3	0	0	0	0
+15 mins.	1	2	0	3	1	0	1	2	0	1	5	6	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	2	0	2	0	0	0	0
+45 mins.	0	2	0	2	0	0	0	0	0	1	1	2	2	0	0	2
Total Volume	2	10	0	12	2	0	1	3	0	7	6	13	2	0	0	2
% App. Total	16.7	83.3	0		66.7	0	33.3		0	53.8	46.2		100	0	0	
PHF	.500	.500	.000	.500	.500	.000	.250	.375	.000	.583	.300	.542	.250	.000	.000	.250

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

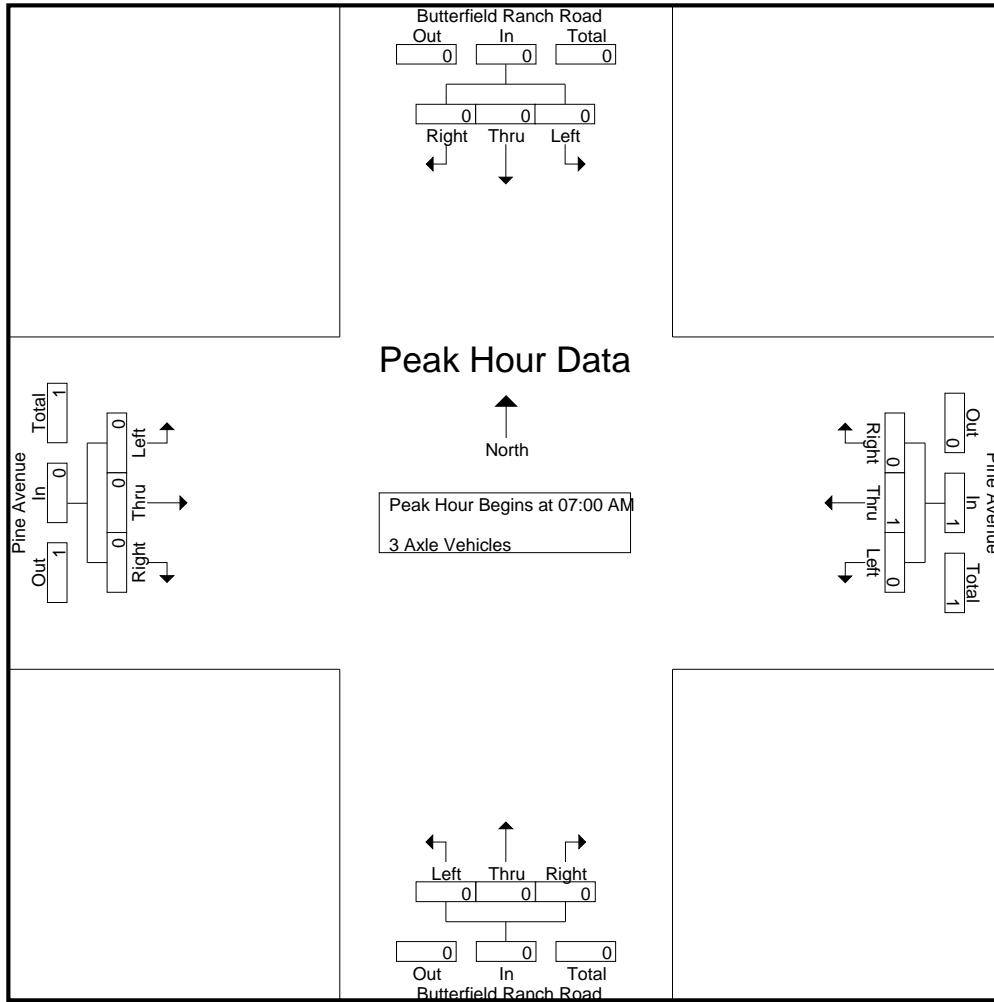
Groups Printed- 3 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
Apprch %	0	0	0		0	100	0		0	0	0		0	100	0		
Total %	0	0	0		0	50	0	50	0	0	0		0	50	0	50	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		0	100	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

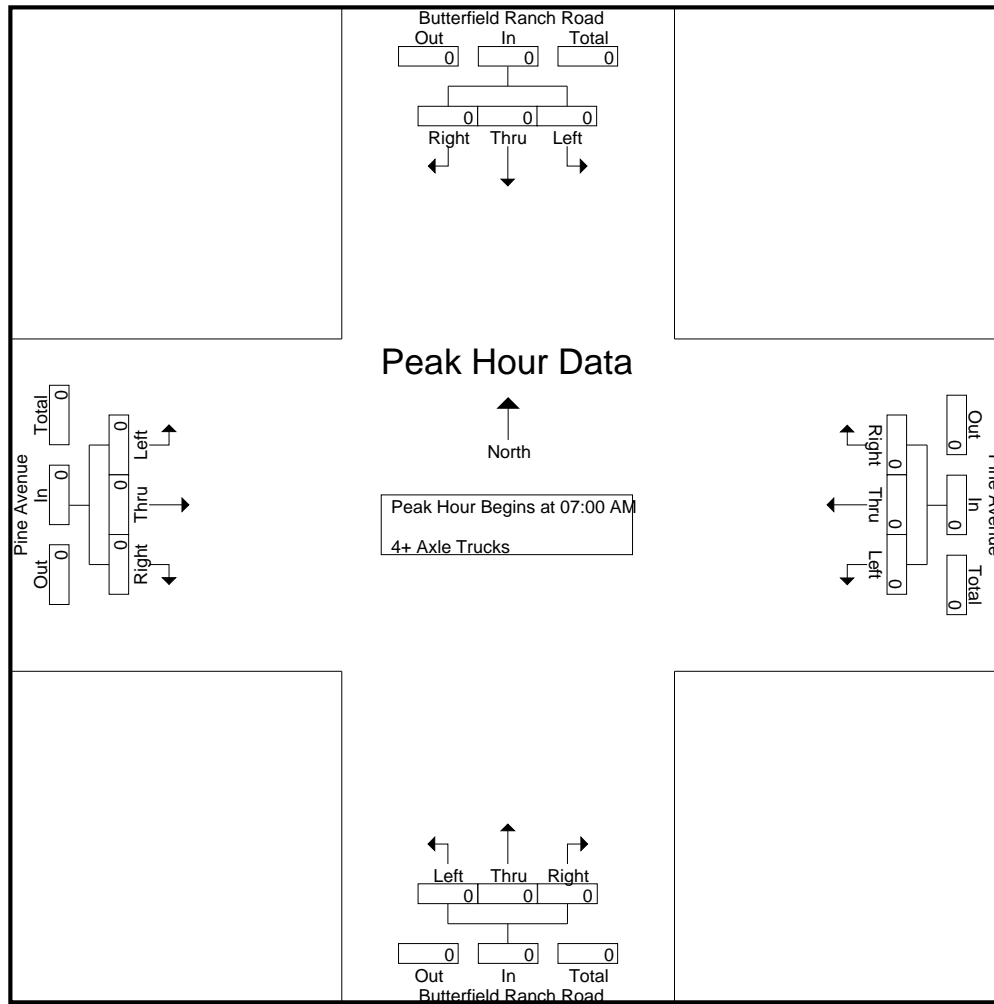
Groups Printed- 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine AM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

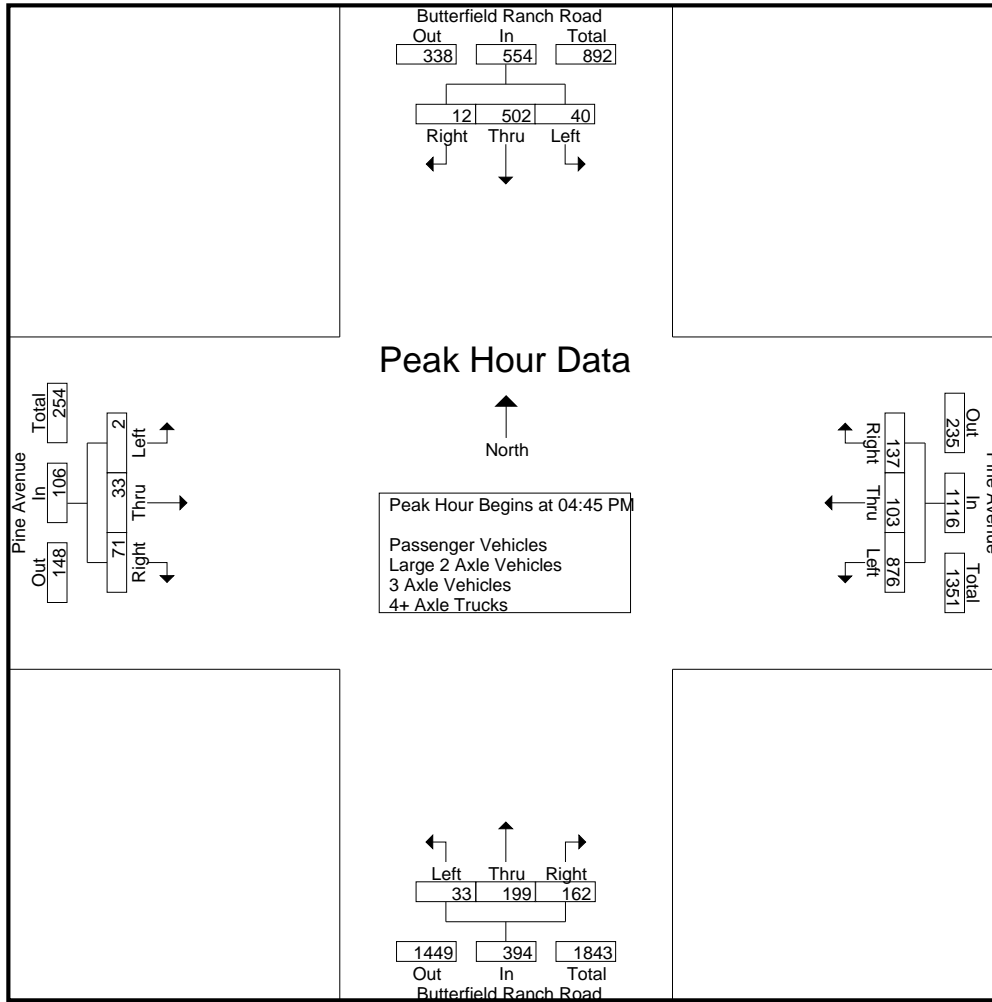
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	7	82	2	91	218	7	22	247	6	52	29	87	2	9	4	15	440
04:15 PM	12	123	2	137	237	35	27	299	7	38	42	87	0	7	17	24	547
04:30 PM	11	122	2	135	186	24	36	246	3	48	38	89	1	12	16	29	499
04:45 PM	8	124	4	136	236	34	28	298	2	52	38	92	1	5	29	35	561
Total	38	451	10	499	877	100	113	1090	18	190	147	355	4	33	66	103	2047
05:00 PM	14	131	1	146	191	13	36	240	12	43	45	100	0	12	7	19	505
05:15 PM	7	134	4	145	233	23	29	285	7	52	35	94	1	4	13	18	542
05:30 PM	11	113	3	127	216	33	44	293	12	52	44	108	0	12	22	34	562
05:45 PM	7	115	1	123	238	32	44	314	6	40	39	85	2	9	15	26	548
Total	39	493	9	541	878	101	153	1132	37	187	163	387	3	37	57	97	2157
Grand Total	77	944	19	1040	1755	201	266	2222	55	377	310	742	7	70	123	200	4204
Apprch %	7.4	90.8	1.8		79	9	12		7.4	50.8	41.8		3.5	35	61.5		
Total %	1.8	22.5	0.5	24.7	41.7	4.8	6.3	52.9	1.3	9	7.4	17.6	0.2	1.7	2.9	4.8	
Passenger Vehicles	77	939	19	1035	1737	201	265	2203	55	376	304	735	7	70	123	200	4173
% Passenger Vehicles	100	99.5	100	99.5	99	100	99.6	99.1	100	99.7	98.1	99.1	100	100	100	100	99.3
Large 2 Axle Vehicles	0	5	0	5	16	0	1	17	0	1	5	6	0	0	0	0	28
% Large 2 Axle Vehicles	0	0.5	0	0.5	0.9	0	0.4	0.8	0	0.3	1.6	0.8	0	0	0	0	0.7
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	2	0	0	2	0	0	1	1	0	0	0	0	3
% 4+ Axle Trucks	0	0	0	0	0.1	0	0	0.1	0	0	0.3	0.1	0	0	0	0	0.1

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	124	4	136	236	34	28	298	2	52	38	92	1	5	29	35	561
05:00 PM	14	131	1	146	191	13	36	240	12	43	45	100	0	12	7	19	505
05:15 PM	7	134	4	145	233	23	29	285	7	52	35	94	1	4	13	18	542
05:30 PM	11	113	3	127	216	33	44	293	12	52	44	108	0	12	22	34	562
Total Volume	40	502	12	554	876	103	137	1116	33	199	162	394	2	33	71	106	2170
% App. Total	7.2	90.6	2.2		78.5	9.2	12.3		8.4	50.5	41.1		1.9	31.1	67		
PHF	.714	.937	.750	.949	.928	.757	.778	.936	.688	.957	.900	.912	.500	.688	.612	.757	.965

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				05:00 PM				04:45 PM				04:15 PM			
+0 mins.	11	122	2	135	191	13	36	240	2	52	38	92	0	7	17	24
+15 mins.	8	124	4	136	233	23	29	285	12	43	45	100	1	12	16	29
+30 mins.	14	131	1	146	216	33	44	293	7	52	35	94	1	5	29	35
+45 mins.	7	134	4	145	238	32	44	314	12	52	44	108	0	12	7	19
Total Volume	40	511	11	562	878	101	153	1132	33	199	162	394	2	36	69	107
% App. Total	7.1	90.9	2		77.6	8.9	13.5		8.4	50.5	41.1		1.9	33.6	64.5	
PHF	.714	.953	.688	.962	.922	.765	.869	.901	.688	.957	.900	.912	.500	.750	.595	.764

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

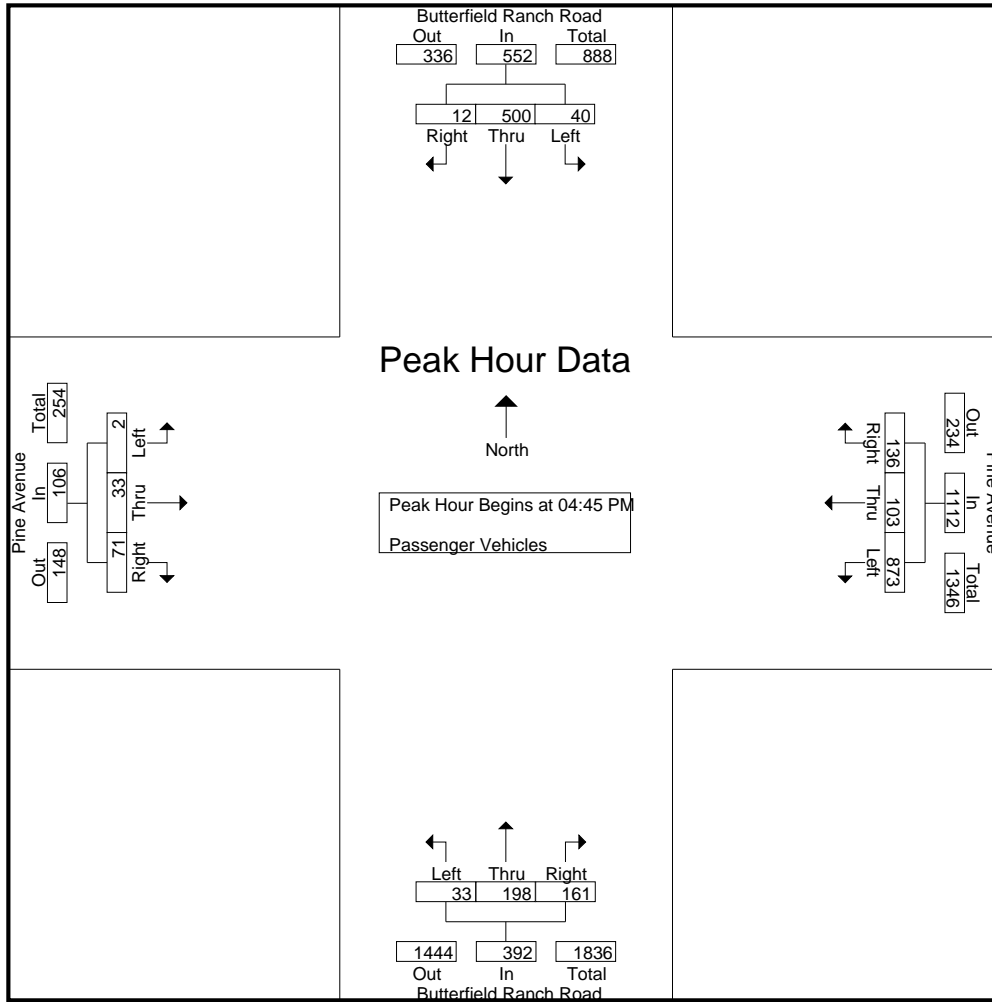
Groups Printed- Passenger Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	7	82	2	91	214	7	22	243	6	52	26	84	2	9	4	15	433
04:15 PM	12	122	2	136	237	35	27	299	7	38	42	87	0	7	17	24	546
04:30 PM	11	121	2	134	180	24	36	240	3	48	37	88	1	12	16	29	491
04:45 PM	8	123	4	135	234	34	27	295	2	51	38	91	1	5	29	35	556
Total	38	448	10	496	865	100	112	1077	18	189	143	350	4	33	66	103	2026
05:00 PM	14	131	1	146	191	13	36	240	12	43	44	99	0	12	7	19	504
05:15 PM	7	133	4	144	232	23	29	284	7	52	35	94	1	4	13	18	540
05:30 PM	11	113	3	127	216	33	44	293	12	52	44	108	0	12	22	34	562
05:45 PM	7	114	1	122	233	32	44	309	6	40	38	84	2	9	15	26	541
Total	39	491	9	539	872	101	153	1126	37	187	161	385	3	37	57	97	2147
Grand Total	77	939	19	1035	1737	201	265	2203	55	376	304	735	7	70	123	200	4173
Apprch %	7.4	90.7	1.8		78.8	9.1	12		7.5	51.2	41.4		3.5	35	61.5		
Total %	1.8	22.5	0.5	24.8	41.6	4.8	6.4	52.8	1.3	9	7.3	17.6	0.2	1.7	2.9	4.8	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	8	123	4	135	234	34	27	295	2	51	38	91	1	5	29	35	556
05:00 PM	14	131	1	146	191	13	36	240	12	43	44	99	0	12	7	19	504
05:15 PM	7	133	4	144	232	23	29	284	7	52	35	94	1	4	13	18	540
05:30 PM	11	113	3	127	216	33	44	293	12	52	44	108	0	12	22	34	562
Total Volume	40	500	12	552	873	103	136	1112	33	198	161	392	2	33	71	106	2162
% App. Total	7.2	90.6	2.2		78.5	9.3	12.2		8.4	50.5	41.1		1.9	31.1	67		
PHF	.714	.940	.750	.945	.933	.757	.773	.942	.688	.952	.915	.907	.500	.688	.612	.757	.962

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	8	123	4	135	234	34	27	295	2	51	38	91	1	5	29	35
+15 mins.	14	131	1	146	191	13	36	240	12	43	44	99	0	12	7	19
+30 mins.	7	133	4	144	232	23	29	284	7	52	35	94	1	4	13	18
+45 mins.	11	113	3	127	216	33	44	293	12	52	44	108	0	12	22	34
Total Volume	40	500	12	552	873	103	136	1112	33	198	161	392	2	33	71	106
% App. Total	7.2	90.6	2.2		78.5	9.3	12.2		8.4	50.5	41.1		1.9	31.1	67	
PHF	.714	.940	.750	.945	.933	.757	.773	.942	.688	.952	.915	.907	.500	.688	.612	.757

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

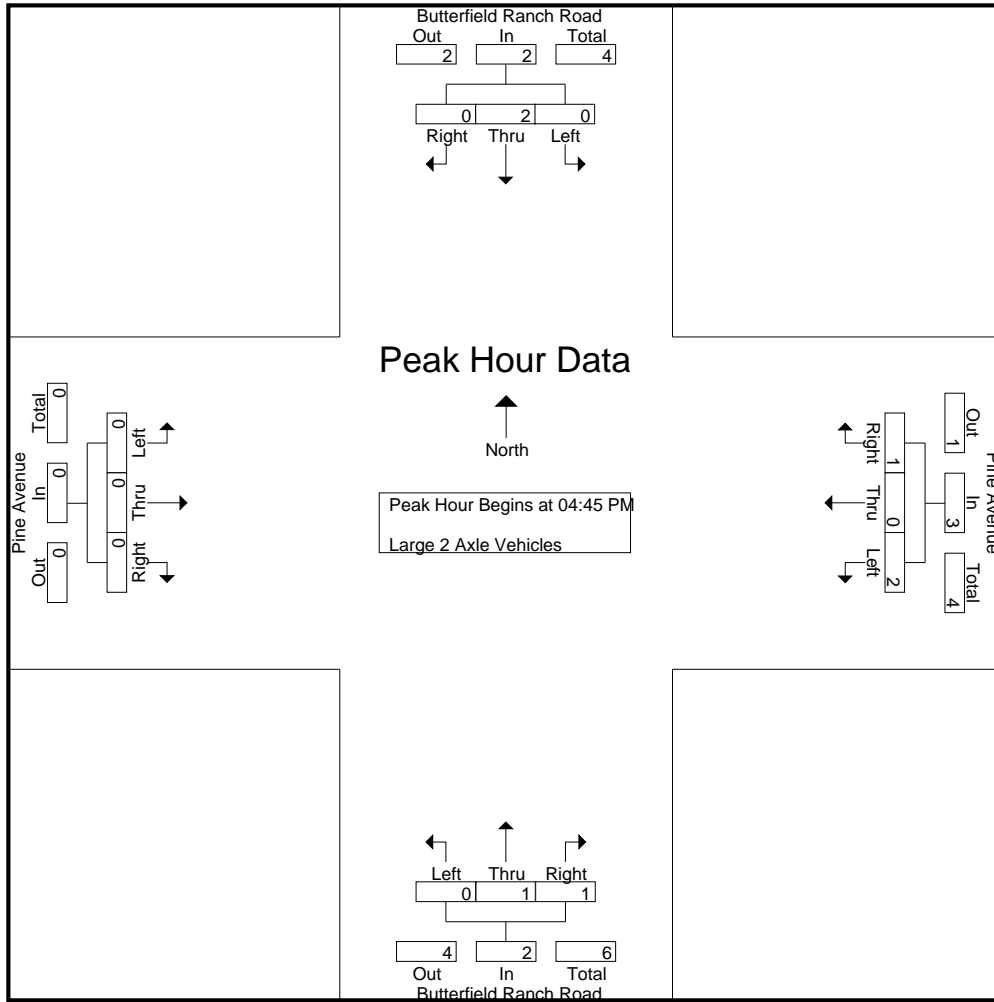
Groups Printed- Large 2 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	4	0	0	4	0	0	3	3	0	0	0	0	7
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	1	6	0	0	6	0	0	1	1	0	0	0	0	8
04:45 PM	0	1	0	1	2	0	1	3	0	1	0	1	0	0	0	0	5
Total	0	3	0	3	12	0	1	13	0	1	4	5	0	0	0	0	21
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
05:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	1	0	1	4	0	0	4	0	0	0	0	0	0	0	0	5
Total	0	2	0	2	4	0	0	4	0	0	1	1	0	0	0	0	7
Grand Total	0	5	0	5	16	0	1	17	0	1	5	6	0	0	0	0	28
Apprch %	0	100	0		94.1	0	5.9		0	16.7	83.3		0	0	0		
Total %	0	17.9	0	17.9	57.1	0	3.6	60.7	0	3.6	17.9	21.4	0	0	0	0	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	1	0	1	2	0	1	3	0	1	0	1	0	0	0	0	5
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
05:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	2	0	1	3	0	1	1	2	0	0	0	0	7
% App. Total	0	100	0		66.7	0	33.3		0	50	50		0	0	0		
PHF	.000	.500	.000	.500	.250	.000	.250	.250	.000	.250	.250	.500	.000	.000	.000	.000	.350

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	1	0	1	2	0	1	3	0	1	0	1	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	2	0	1	3	0	1	1	2	0	0	0	0
% App. Total	0	100	0	0	66.7	0	33.3	0	0	50	50	0	0	0	0	0
PHF	.000	.500	.000	.500	.250	.000	.250	.250	.000	.250	.250	.500	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

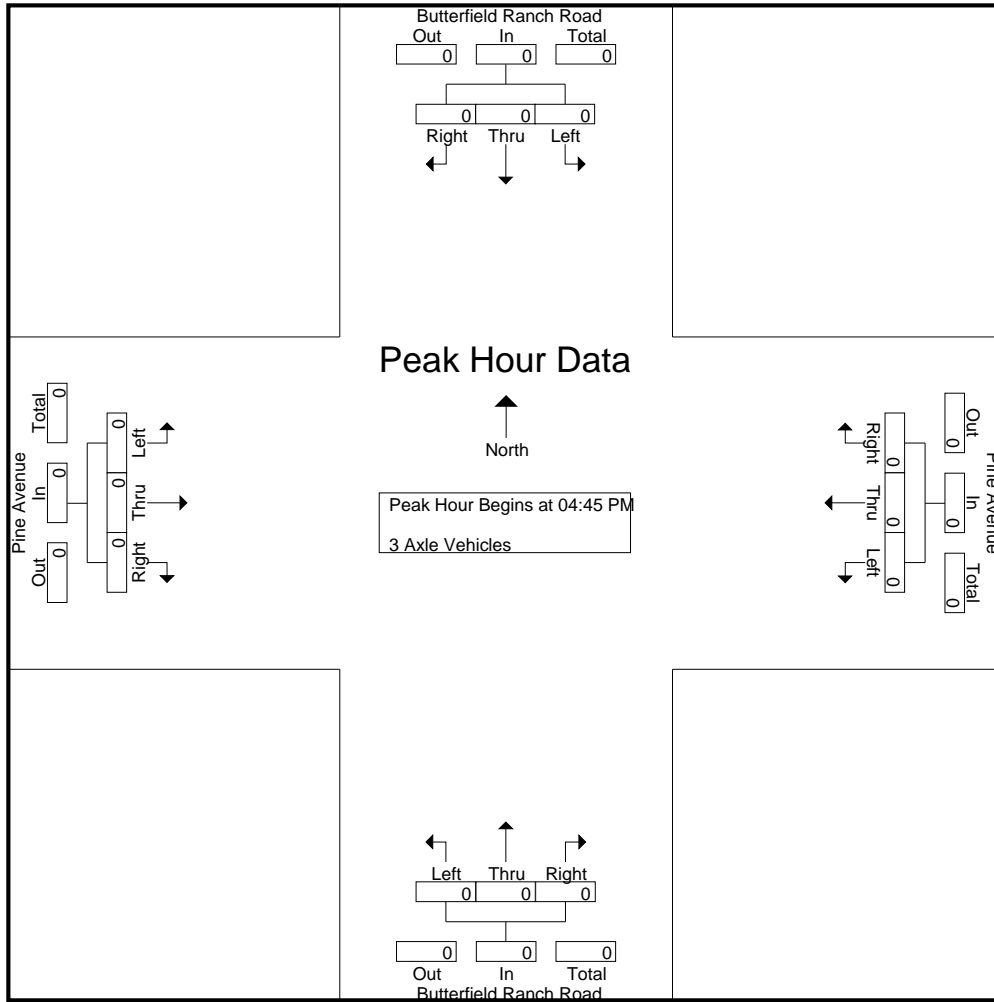
Groups Printed- 3 Axle Vehicles

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
 Page No : 1

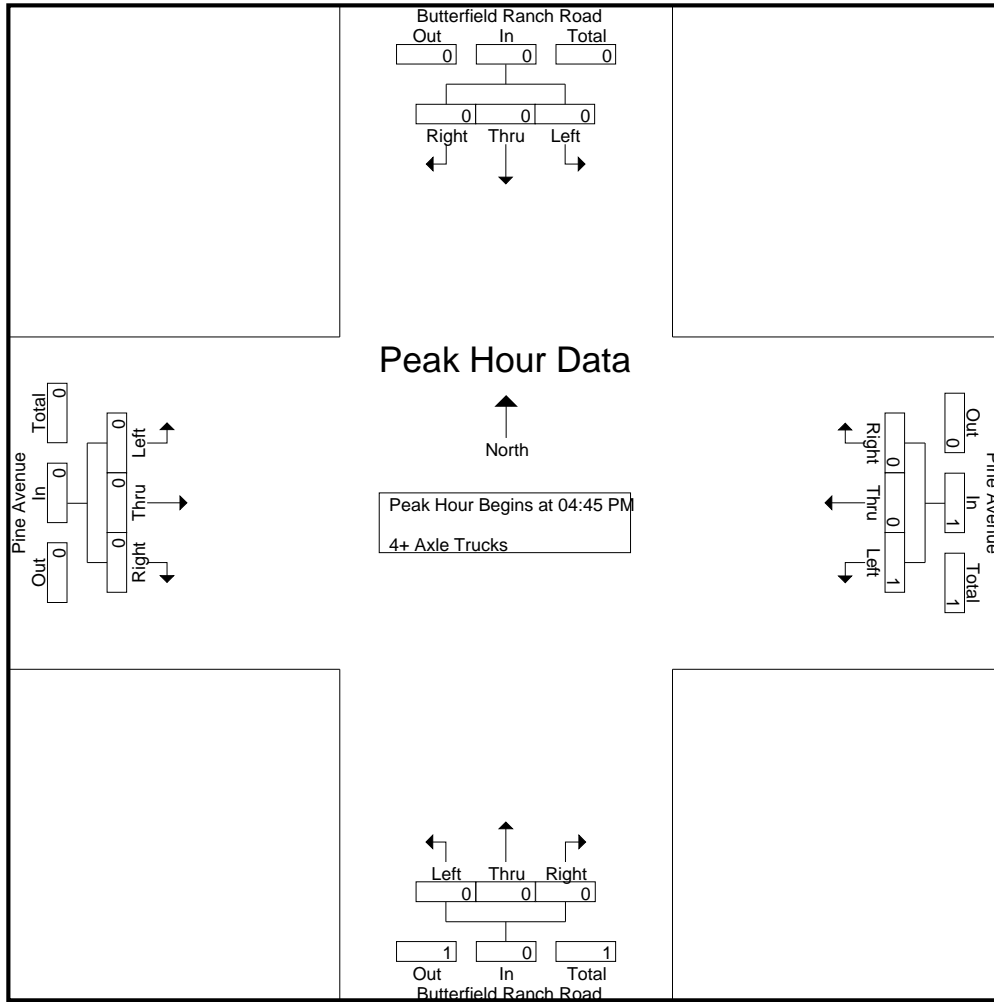
Groups Printed- 4+ Axle Trucks

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	2
Total	0	0	0	0	2	0	0	2	0	0	1	1	0	0	0	0	3
Grand Total	0	0	0	0	2	0	0	2	0	0	1	1	0	0	0	0	3
Apprch %	0	0	0		100	0	0		0	0	100		0	0	0		
Total %	0	0	0	0	66.7	0	0	66.7	0	0	33.3	33.3	0	0	0	0	

Start Time	Butterfield Ranch Road Southbound				Pine Avenue Westbound				Butterfield Ranch Road Northbound				Pine Avenue Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		100	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

City of Chino Hills
 N/S: Butterfield Ranch Road
 E/W: Pine Avenue
 Weather: Clear

File Name : 17_CHH_Butterfield_Pine PM
 Site Code : 05720076
 Start Date : 2/6/2020
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Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

APPENDIX C

EXISTING TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX C-1

EXISTING TRAFFIC CONDITIONS

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

Control Type:	All-way stop	Delay (sec / veh):	7.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.151

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	14	0	27	12	66	66	10	0	0	6	77
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	14	0	27	12	66	66	10	0	0	6	77
Peak Hour Factor	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850
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	4	0	9	4	21	21	3	0	0	2	25
Total Analysis Volume [veh/h]	3	18	0	34	15	84	84	13	0	0	8	98
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	792	884	792	940
Degree of Utilization, x	0.03	0.15	0.12	0.11

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	0.53	0.42	0.38
95th-Percentile Queue Length [ft]	2.04	13.22	10.43	9.49
Approach Delay [s/veh]	7.67	7.80	8.18	7.31
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.75			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	38.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

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]	33	0	284	243	17	32	0	736	24	206	302	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]	33	0	284	243	17	32	0	736	24	206	302	0
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	1.0000	0.9140	0.9140	0.9140	0.9140	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]	9	0	78	66	5	9	0	201	7	56	83	0
Total Analysis Volume [veh/h]	36	0	311	266	19	35	0	805	26	225	330	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 in	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]	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]	22	22	0	0	25	0	0	25	0	18	43	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]	90	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	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]	18	18	18	18	18	24	24	14	42
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.20	0.26	0.26	0.16	0.46
(v / s)_i Volume / Saturation Flow Rate	0.02	0.17	0.08	0.08	0.02	0.23	0.23	0.13	0.09
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	344	364	344	344	364	471	471	266	1665
d1, Uniform Delay [s]	29.32	34.69	31.32	31.33	29.27	31.97	31.97	36.97	14.34
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.23	0.23	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]	0.61	21.78	3.64	3.67	0.53	10.79	10.79	7.22	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	0.10	0.85	0.41	0.42	0.10	0.88	0.88	0.85	0.20
d, Delay for Lane Group [s/veh]	29.93	56.48	34.95	35.01	29.79	42.75	42.75	44.19	14.40
Lane Group LOS	C	E	C	D	C	D	D	D	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.68	8.53	2.96	2.98	0.65	9.48	9.48	5.09	1.81
50th-Percentile Queue Length [ft/ln]	16.94	213.34	73.97	74.46	16.36	236.90	236.90	127.17	45.36
95th-Percentile Queue Length [veh/ln]	1.22	13.32	5.33	5.36	1.18	14.52	14.52	8.79	3.27
95th-Percentile Queue Length [ft/ln]	30.50	333.12	133.15	134.02	29.44	363.11	363.11	219.65	81.65

Movement, Approach, & Intersection Results

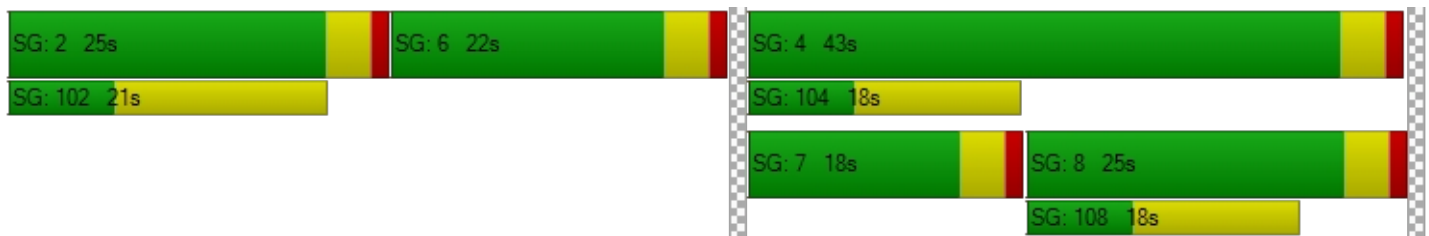
d_M, Delay for Movement [s/veh]	29.93	0.00	56.48	34.98	35.01	29.79	0.00	42.75	42.75	44.19	14.40	0.00
Movement LOS	C		E	C	D	C		D	D	D	B	
d_A, Approach Delay [s/veh]	53.72			34.41			42.75			26.48		
Approach LOS	D			C			D			C		
d_I, Intersection Delay [s/veh]	38.91											
Intersection LOS	D											
Intersection V/C	0.715											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	34.67	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.174	2.222	2.581	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]	400	467	467	867
d_b, Bicycle Delay [s]	28.80	26.45	26.45	14.45
I_b,int, Bicycle LOS Score for Intersection	1.560	2.088	2.245	2.017
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):	15.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.344

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]	264	42	49	404	279	47
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]	264	42	49	404	279	47
Peak Hour Factor	0.8980	0.8980	0.8980	0.8980	0.8980	0.8980
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	12	14	112	78	13
Total Analysis Volume [veh/h]	294	47	55	450	311	52
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 in	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	56	56
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	0.10	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	339	359	1245	2562	1109	1109
d1, Uniform Delay [s]	34.89	29.63	3.87	4.27	7.37	7.37
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.74	0.16	0.07	0.15	0.32	0.32
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	0.04	0.18	0.16	0.16
d, Delay for Lane Group [s/veh]	41.64	29.80	3.93	4.42	7.69	7.69
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.81	0.85	0.23	0.99	1.31	1.31
50th-Percentile Queue Length [ft/ln]	170.21	21.36	5.75	24.72	32.77	32.77
95th-Percentile Queue Length [veh/ln]	11.09	1.54	0.41	1.78	2.36	2.36
95th-Percentile Queue Length [ft/ln]	277.19	38.45	10.35	44.50	58.99	58.99

Movement, Approach, & Intersection Results

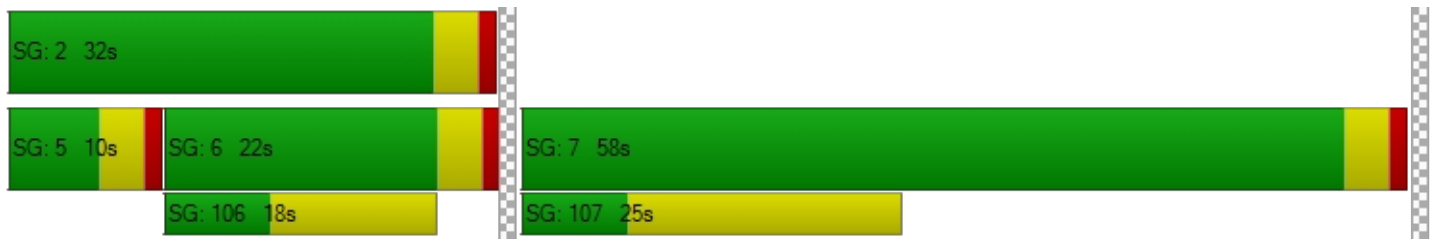
d_M, Delay for Movement [s/veh]	41.64	29.80	3.93	4.42	7.69	7.69
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	40.01		4.37		7.69	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.42					
Intersection LOS	B					
Intersection V/C	0.344					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.111	2.552	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	1.976	1.859
Bicycle LOS	A	A	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):	19.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	35	0	166	7	0	7	7	262	37	68	259	10
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]	35	0	166	7	0	7	7	262	37	68	259	10
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
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	48	2	0	2	2	76	11	20	75	3
Total Analysis Volume [veh/h]	41	0	193	8	0	8	8	305	43	79	302	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	0.12	0.00	0.23	0.03	0.00	0.01	0.01	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	18.83	20.44	12.24	18.97	18.11	9.55	7.91	0.00	0.00	8.19	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.60	1.60	1.60	0.12	0.12	0.12	0.02	0.00	0.00	0.21	0.00	0.00
95th-Percentile Queue Length [ft/ln]	39.89	39.89	39.89	3.08	3.08	3.08	0.49	0.00	0.00	5.24	0.00	0.00
d_A, Approach Delay [s/veh]	13.40			14.26			0.18			1.65		
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):	0.153

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	47	0	2	5	0	35	22	276	39	7	264	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]	47	0	2	5	0	35	22	276	39	7	264	7
Peak Hour Factor	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450
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	7	82	12	2	78	2
Total Analysis Volume [veh/h]	56	0	2	6	0	41	26	327	46	8	312	8
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 in	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	38	0	0	38	0	0	52	0	0	52	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	0.78	0.78	0.13	0.13	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.02	0.11	0.10	0.00	0.09	0.09
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1401	1367	133	240	240	105	240	240
d1, Uniform Delay [s]	2.30	2.28	34.27	37.71	37.59	33.91	37.05	37.03
k, delay calibration	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
d2, Incremental Delay [s]	0.06	0.05	0.71	5.72	5.09	0.31	3.21	3.17
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	0.20	0.79	0.77	0.08	0.67	0.67
d, Delay for Lane Group [s/veh]	2.35	2.33	34.98	43.43	42.68	34.21	40.26	40.20
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]	0.15	0.12	0.50	4.20	4.04	0.15	3.40	3.38
50th-Percentile Queue Length [ft/ln]	3.86	3.12	12.59	105.09	101.06	3.86	84.96	84.45
95th-Percentile Queue Length [veh/ln]	0.28	0.22	0.91	7.57	7.28	0.28	6.12	6.08
95th-Percentile Queue Length [ft/ln]	6.95	5.61	22.67	189.15	181.90	6.94	152.92	152.01

Movement, Approach, & Intersection Results

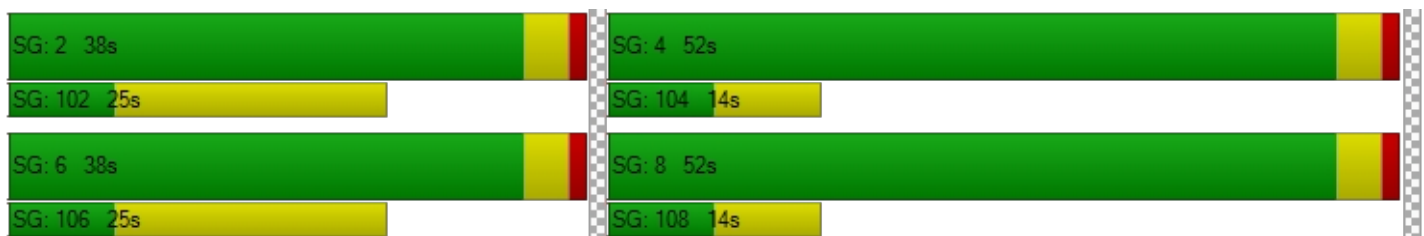
d_M, Delay for Movement [s/veh]	2.35	2.35	2.35	2.33	2.33	2.33	34.98	43.12	42.68	34.21	40.23	40.20
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.35			2.33			42.54			40.08		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.50											
Intersection LOS	D											
Intersection V/C	0.153											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.799			1.804			2.615			2.502		
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]	756			756			1067			1067		
d_b, Bicycle Delay [s]	17.42			17.42			9.80			9.80		
I_b,int, Bicycle LOS Score for Intersection	1.655			1.637			1.889			1.830		
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):	17.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.360

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	30	411	287	75	329	80	55	62	36	74	36	48
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]	30	411	287	75	329	80	55	62	36	74	36	48
Peak Hour Factor	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260
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	124	87	23	100	24	17	19	11	22	11	15
Total Analysis Volume [veh/h]	36	498	347	91	398	97	67	75	44	90	44	58
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 in	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]	21	35	35	10	24	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	59	69	6	61	61	5	8	6	9	9
g / C, Green / Cycle	0.04	0.62	0.73	0.06	0.64	0.64	0.05	0.09	0.06	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.19	0.03	0.11	0.05	0.04	0.07	0.03	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]	68	2245	1313	187	2312	1156	91	154	205	173	173
d1, Uniform Delay [s]	44.80	7.82	4.31	43.41	6.85	6.44	44.37	42.59	42.89	40.05	39.95
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
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
d2, Incremental Delay [s]	6.24	0.23	0.49	1.95	0.16	0.14	10.92	7.91	1.48	0.99	0.88
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	0.53	0.22	0.26	0.49	0.17	0.08	0.74	0.77	0.44	0.31	0.28
d, Delay for Lane Group [s/veh]	51.04	8.05	4.80	45.36	7.01	6.58	55.29	50.50	44.37	41.05	40.83
Lane Group LOS	D	A	A	D	A	A	E	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	1.84	1.61	1.03	1.26	0.60	1.79	2.99	1.03	1.17	1.07
50th-Percentile Queue Length [ft/ln]	22.79	45.93	40.17	25.69	31.46	14.97	44.70	74.81	25.82	29.36	26.81
95th-Percentile Queue Length [veh/ln]	1.64	3.31	2.89	1.85	2.27	1.08	3.22	5.39	1.86	2.11	1.93
95th-Percentile Queue Length [ft/ln]	41.02	82.68	72.30	46.24	56.63	26.94	80.45	134.66	46.47	52.84	48.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.04	8.05	4.80	45.36	7.01	6.58	55.29	50.50	50.50	44.37	41.05	40.86
Movement LOS	D	A	A	D	A	A	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.53			12.90			52.23			42.55		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.86											
Intersection LOS	B											
Intersection V/C	0.360											

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]	37.14			37.14			37.14			37.14		
I_p,int, Pedestrian LOS Score for Intersection	2.838			2.905			2.100			2.608		
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]	653			421			758			737		
d_b, Bicycle Delay [s]	21.56			29.61			18.32			18.95		
I_b,int, Bicycle LOS Score for Intersection	2.286			2.043			1.867			1.876		
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):	0.142

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	12	1	44	19	31	36	14	6	0	3	44
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	12	1	44	19	31	36	14	6	0	3	44
Peak Hour Factor	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610
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	4	0	14	6	10	12	5	2	0	1	14
Total Analysis Volume [veh/h]	1	16	1	58	25	41	47	18	8	0	4	58
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	832	870	825	957
Degree of Utilization, x	0.02	0.14	0.09	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.07	0.50	0.29	0.21
95th-Percentile Queue Length [ft]	1.66	12.39	7.26	5.18
Approach Delay [s/veh]	7.42	7.82	7.79	7.02
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.61			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	46.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

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]	31	0	150	704	89	103	0	341	69	126	220	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]	31	0	150	704	89	103	0	341	69	126	220	0
Peak Hour Factor	0.9150	0.9150	0.9150	0.9150	0.9150	0.9150	1.0000	0.9150	0.9150	0.9150	0.9150	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]	8	0	41	192	24	28	0	93	19	34	60	0
Total Analysis Volume [veh/h]	34	0	164	769	97	113	0	373	75	138	240	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 in	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
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	53	75	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]	110	110	110	110	110	110	110	110	110
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]	33	33	33	33	33	16	16	11	31
g / C, Green / Cycle	0.30	0.30	0.30	0.30	0.30	0.15	0.15	0.10	0.28
(v / s)_i Volume / Saturation Flow Rate	0.02	0.09	0.25	0.25	0.06	0.12	0.12	0.08	0.07
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	515	546	515	515	546	268	268	170	1025
d1, Uniform Delay [s]	27.31	29.44	35.90	35.90	28.55	45.61	45.61	48.59	30.19
k, delay calibration	0.50	0.50	0.50	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]	0.25	1.41	15.17	15.17	0.86	6.83	6.83	8.97	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	0.07	0.30	0.84	0.84	0.21	0.84	0.84	0.81	0.23
d, Delay for Lane Group [s/veh]	27.55	30.85	51.08	51.08	29.41	52.44	52.44	57.56	30.31
Lane Group LOS	C	C	D	D	C	D	D	E	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.67	3.50	12.74	12.74	2.32	6.26	6.26	4.03	2.37
50th-Percentile Queue Length [ft/ln]	16.66	87.38	318.43	318.43	58.07	156.54	156.54	100.63	59.37
95th-Percentile Queue Length [veh/ln]	1.20	6.29	18.59	18.59	4.18	10.37	10.37	7.25	4.27
95th-Percentile Queue Length [ft/ln]	29.98	157.29	464.76	464.76	104.53	259.13	259.13	181.14	106.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.55	0.00	30.85	51.08	51.08	29.41	0.00	52.44	52.44	57.56	30.31	0.00
Movement LOS	C		C	D	D	C		D	D	E	C	
d_A, Approach Delay [s/veh]	30.29			48.58				52.44		40.26		
Approach LOS	C			D				D		D		
d_I, Intersection Delay [s/veh]	46.06											
Intersection LOS	D											
Intersection V/C	0.619											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	44.55		44.55		44.55		0.00
l_p,int, Pedestrian LOS Score for Intersection	2.142		2.419		2.446		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]	109		382		327		1291
d_b, Bicycle Delay [s]	49.16		36.00		38.47		6.91
l_b,int, Bicycle LOS Score for Intersection	1.560		3.175		1.929		1.871
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):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.326

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]	174	37	66	482	409	73
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]	174	37	66	482	409	73
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	11	19	137	116	21
Total Analysis Volume [veh/h]	198	42	75	549	466	83
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 in	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	0.12	0.02	0.04	0.15	0.15	0.15
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	241	255	1311	2769	1201	1201
d1, Uniform Delay [s]	37.52	33.94	2.51	2.83	5.88	5.88
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.80	0.30	0.08	0.16	0.44	0.44
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	0.16	0.06	0.20	0.23	0.23
d, Delay for Lane Group [s/veh]	44.32	34.24	2.59	2.99	6.33	6.33
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.67	0.83	0.20	0.77	1.68	1.68
50th-Percentile Queue Length [ft/ln]	116.75	20.75	5.07	19.36	42.06	42.06
95th-Percentile Queue Length [veh/ln]	8.21	1.49	0.37	1.39	3.03	3.03
95th-Percentile Queue Length [ft/ln]	205.36	37.35	9.13	34.85	75.70	75.70

Movement, Approach, & Intersection Results

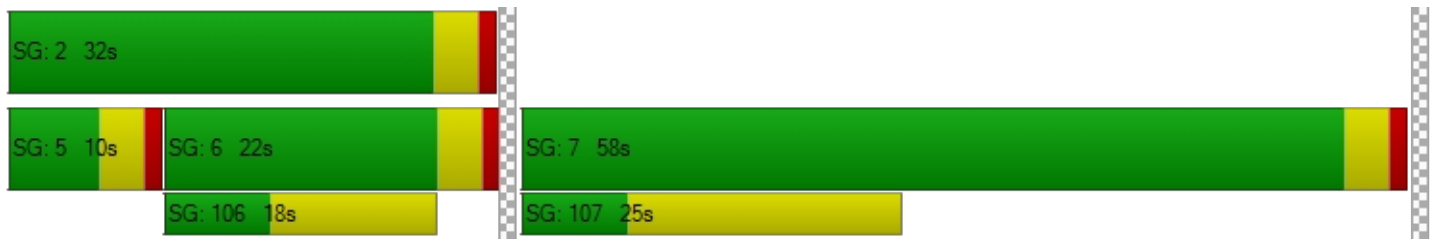
d_M, Delay for Movement [s/veh]	44.32	34.24	2.59	2.99	6.33	6.33
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.56		2.94		6.33	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.99					
Intersection LOS	B					
Intersection V/C	0.326					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.121	2.630	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.074	2.013
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):	36.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	37	2	84	2	0	6	10	463	93	118	308	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]	37	2	84	2	0	6	10	463	93	118	308	11
Peak Hour Factor	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820
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	1	24	1	0	2	3	131	26	33	87	3
Total Analysis Volume [veh/h]	42	2	95	2	0	7	11	525	105	134	349	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	0.26	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]	34.62	36.27	17.61	25.89	30.70	9.49	8.04	0.00	0.00	9.42	0.00	0.00
Movement LOS	D	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.96	1.96	1.96	0.06	0.06	0.06	0.03	0.00	0.00	0.49	0.00	0.00
95th-Percentile Queue Length [ft/ln]	48.89	48.89	48.89	1.52	1.52	1.52	0.70	0.00	0.00	12.28	0.00	0.00
d_A, Approach Delay [s/veh]	23.02			13.14			0.14			2.55		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	3.64											
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):	0.303

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	60	6	17	2	8	33	52	495	153	10	359	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]	60	6	17	2	8	33	52	495	153	10	359	6
Peak Hour Factor	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530
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	10	15	145	45	3	105	2
Total Analysis Volume [veh/h]	70	7	20	2	9	39	61	580	179	12	421	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 in	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	0.25	0.25	0.25	0.25	0.25	0.25
(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]	1189	1161	300	454	454	119	454	454
d1, Uniform Delay [s]	5.55	5.39	26.04	32.16	31.47	25.29	28.50	28.49
k, delay calibration	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
d2, Incremental Delay [s]	0.13	0.07	0.33	5.24	3.34	0.37	0.76	0.76
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	0.47	0.47
d, Delay for Lane Group [s/veh]	5.69	5.46	26.37	37.40	34.81	25.66	29.27	29.25
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	0.29	0.98	8.30	7.31	0.19	3.77	3.75
50th-Percentile Queue Length [ft/ln]	14.49	7.26	24.57	207.43	182.76	4.86	94.27	93.83
95th-Percentile Queue Length [veh/ln]	1.04	0.52	1.77	13.02	11.74	0.35	6.79	6.76
95th-Percentile Queue Length [ft/ln]	26.07	13.07	44.22	325.52	293.61	8.76	169.69	168.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.69	5.69	5.69	5.46	5.46	5.46	26.37	36.57	34.81	25.66	29.26	29.25
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.69			5.46			35.43			29.16		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.35											
Intersection LOS	C											
Intersection V/C	0.303											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.924			1.882			2.794			2.607		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.720			1.642			2.236			1.923		
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):	33.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.600

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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		
	34	204	166	41	513	12	2	34	72	897	105	141
Base Volume Input [veh/h]	34	204	166	41	513	12	2	34	72	897	105	141
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]	34	204	166	41	513	12	2	34	72	897	105	141
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
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	53	43	11	133	3	1	9	19	232	27	37
Total Analysis Volume [veh/h]	35	211	172	42	532	12	2	35	75	930	109	146
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 in	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]	21	35	35	10	24	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	53	94	5	53	53	0	9	37	46	46
g / C, Green / Cycle	0.03	0.44	0.79	0.04	0.44	0.44	0.00	0.08	0.31	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.02	0.06	0.10	0.01	0.15	0.01	0.00	0.06	0.29	0.07	0.07
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	1700	1800	3200	1800	1800
c, Capacity [veh/h]	60	1587	1412	123	1599	799	7	139	992	689	689
d1, Uniform Delay [s]	57.04	19.93	3.09	56.23	21.76	18.67	59.60	54.46	40.27	24.59	24.59
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
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
d2, Incremental Delay [s]	8.65	0.17	0.18	1.62	0.56	0.03	19.99	9.70	4.96	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	0.58	0.13	0.12	0.34	0.33	0.02	0.28	0.79	0.94	0.18	0.18
d, Delay for Lane Group [s/veh]	65.69	20.10	3.26	57.85	22.32	18.71	79.59	64.16	45.24	24.72	24.72
Lane Group LOS	E	C	A	E	C	B	E	E	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.16	1.70	0.71	0.62	4.65	0.18	0.10	3.59	13.58	2.39	2.39
50th-Percentile Queue Length [ft/ln]	28.97	42.48	17.77	15.62	116.15	4.57	2.49	89.73	339.39	59.72	59.72
95th-Percentile Queue Length [veh/ln]	2.09	3.06	1.28	1.12	8.18	0.33	0.18	6.46	19.62	4.30	4.30
95th-Percentile Queue Length [ft/ln]	52.14	76.47	31.98	28.11	204.52	8.22	4.48	161.51	490.46	107.49	107.49

Movement, Approach, & Intersection Results

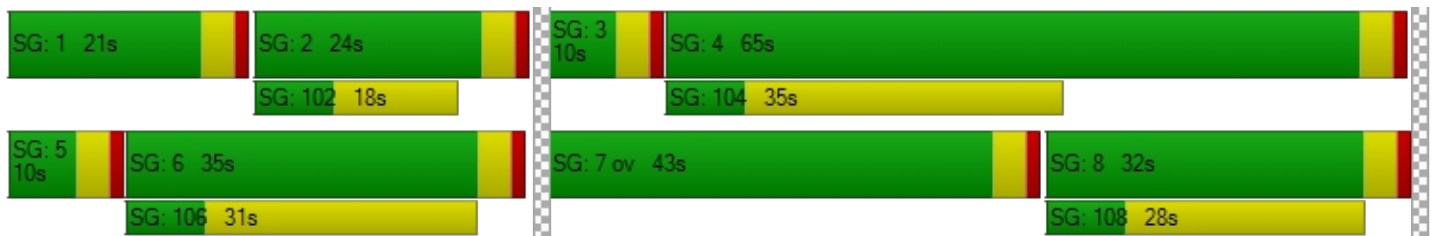
d_M, Delay for Movement [s/veh]	65.69	20.10	3.26	57.85	22.32	18.71	79.59	64.16	64.16	45.24	24.72	24.72
Movement LOS	E	C	A	E	C	B	E	E	E	D	C	C
d_A, Approach Delay [s/veh]	16.99			24.80			64.43			40.82		
Approach LOS	B			C			E			D		
d_I, Intersection Delay [s/veh]	33.56											
Intersection LOS	C											
Intersection V/C	0.600											

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]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersection	2.996			2.849			2.070			2.777		
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			333			467			1017		
d_b, Bicycle Delay [s]	33.00			41.67			35.27			14.50		
I_b,int, Bicycle LOS Score for Intersection	1.904			2.043			1.744			3.515		
Bicycle LOS	A			B			A			D		

Sequence

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



APPENDIX C-II

EXISTING WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.197

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	84	0	27	38	66	66	10	0	0	6	77
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	84	0	27	38	66	66	10	0	0	6	77
Peak Hour Factor	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850
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	27	0	9	12	21	21	3	0	0	2	25
Total Analysis Volume [veh/h]	3	107	0	34	48	84	84	13	0	0	8	98
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	782	841	741	870
Degree of Utilization, x	0.14	0.20	0.13	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.49	0.73	0.45	0.41
95th-Percentile Queue Length [ft]	12.20	18.28	11.25	10.37
Approach Delay [s/veh]	8.36	8.33	8.59	7.71
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.25			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	54.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

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	346	243	26	32	0	745	26	221	302	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	346	243	26	32	0	745	26	221	302	0
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	1.0000	0.9140	0.9140	0.9140	0.9140	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	95	66	7	9	0	204	7	60	83	0
Total Analysis Volume [veh/h]	46	0	379	266	28	35	0	815	28	242	330	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 in	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]	115
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]	31	31	0	0	25	0	0	36	0	23	59	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]	115	115	115	115	115	115	115	115	115
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]	26	26	26	26	26	29	29	19	51
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.22	0.25	0.25	0.16	0.45
(v / s)_i Volume / Saturation Flow Rate	0.03	0.21	0.09	0.09	0.02	0.23	0.23	0.14	0.09
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	381	404	381	381	404	453	453	274	1611
d1, Uniform Delay [s]	35.62	43.90	37.92	37.95	35.35	42.13	42.13	47.23	19.36
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.38	0.38	0.12	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]	0.65	31.85	2.92	2.95	0.42	23.22	23.22	9.80	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	0.12	0.94	0.38	0.39	0.09	0.93	0.93	0.88	0.20
d, Delay for Lane Group [s/veh]	36.27	75.75	40.84	40.91	35.77	65.36	65.36	57.02	19.42
Lane Group LOS	D	E	D	D	D	E	E	E	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.09	13.98	3.78	3.82	0.82	14.13	14.13	7.31	2.58
50th-Percentile Queue Length [ft/ln]	27.34	349.44	94.54	95.42	20.53	353.34	353.34	182.74	64.49
95th-Percentile Queue Length [veh/ln]	1.97	20.11	6.81	6.87	1.48	20.30	20.30	11.74	4.64
95th-Percentile Queue Length [ft/ln]	49.21	502.72	170.17	171.75	36.96	507.47	507.47	293.59	116.07

Movement, Approach, & Intersection Results

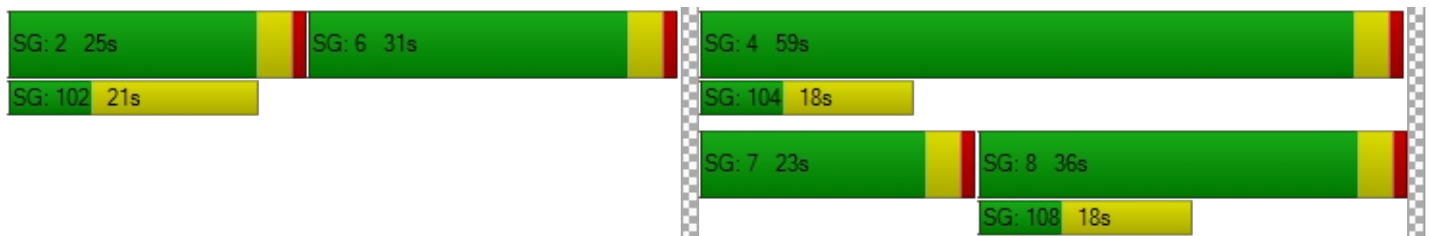
d_M, Delay for Movement [s/veh]	36.27	0.00	75.75	40.87	40.91	35.77	0.00	65.36	65.36	57.02	19.42	0.00
Movement LOS	D		E	D	D	D		E	E	E	B	
d_A, Approach Delay [s/veh]	71.48			40.33				65.36		35.33		
Approach LOS	E			D				E		D		
d_I, Intersection Delay [s/veh]	54.84											
Intersection LOS	D											
Intersection V/C	0.752											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	47.03		47.03		47.03		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.226		2.236		2.601		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]	470		365		557		957
d_b, Bicycle Delay [s]	33.67		38.42		29.95		15.65
I_b,int, Bicycle LOS Score for Intersection	1.560		2.102		2.255		2.032
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):	15.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.347

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]	264	42	49	414	288	47
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]	264	42	49	414	288	47
Peak Hour Factor	0.8980	0.8980	0.8980	0.8980	0.8980	0.8980
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	12	14	115	80	13
Total Analysis Volume [veh/h]	294	47	55	461	321	52
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 in	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	56	56
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	0.10	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	339	359	1243	2562	1109	1109
d1, Uniform Delay [s]	34.89	29.63	3.87	4.29	7.39	7.39
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.74	0.16	0.07	0.15	0.33	0.33
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	0.04	0.18	0.17	0.17
d, Delay for Lane Group [s/veh]	41.64	29.80	3.93	4.44	7.72	7.72
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.81	0.85	0.23	1.02	1.35	1.35
50th-Percentile Queue Length [ft/ln]	170.21	21.36	5.75	25.42	33.78	33.78
95th-Percentile Queue Length [veh/ln]	11.09	1.54	0.41	1.83	2.43	2.43
95th-Percentile Queue Length [ft/ln]	277.19	38.45	10.35	45.75	60.81	60.81

Movement, Approach, & Intersection Results

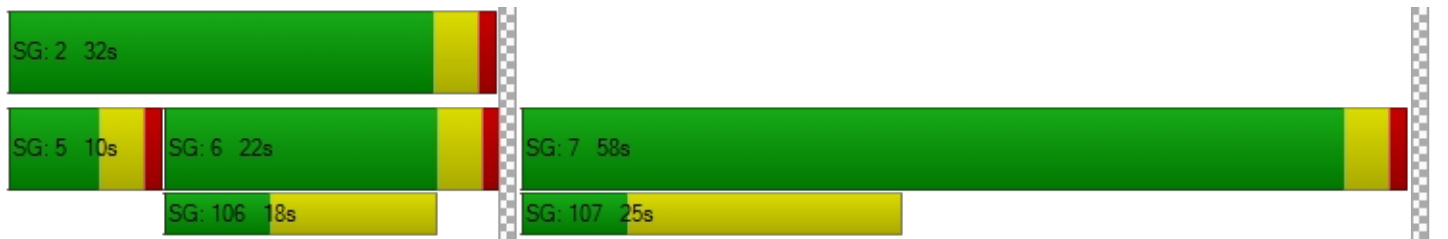
d_M, Delay for Movement [s/veh]	41.64	29.80	3.93	4.44	7.72	7.72
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	40.01		4.39		7.72	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.27					
Intersection LOS	B					
Intersection V/C	0.347					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.111	2.558	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	1.985	1.867
Bicycle LOS	A	A	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):	19.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.157

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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	175	7	0	7	7	264	42	68	268	10
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	175	7	0	7	7	264	42	68	268	10
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
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]	13	0	51	2	0	2	2	77	12	20	78	3
Total Analysis Volume [veh/h]	51	0	204	8	0	8	8	307	49	79	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	0.16	0.00	0.24	0.03	0.00	0.01	0.01	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	19.81	21.49	13.06	19.52	18.46	9.60	7.94	0.00	0.00	8.21	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.93	1.93	1.93	0.13	0.13	0.13	0.02	0.00	0.00	0.21	0.00	0.00
95th-Percentile Queue Length [ft/ln]	48.31	48.31	48.31	3.18	3.18	3.18	0.49	0.00	0.00	5.28	0.00	0.00
d_A, Approach Delay [s/veh]	14.41			14.56			0.17			1.61		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.45											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.155

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	47	0	2	5	0	35	22	282	39	7	282	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]	47	0	2	5	0	35	22	282	39	7	282	7
Peak Hour Factor	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450
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	7	83	12	2	83	2
Total Analysis Volume [veh/h]	56	0	2	6	0	41	26	334	46	8	334	8
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 in	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	38	0	0	38	0	0	52	0	0	52	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	0.78	0.78	0.14	0.14	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.02	0.11	0.10	0.00	0.10	0.09
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1398	1364	126	243	243	105	243	243
d1, Uniform Delay [s]	2.34	2.32	34.11	37.62	37.49	33.75	37.13	37.11
k, delay calibration	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
d2, Incremental Delay [s]	0.06	0.05	0.80	5.73	5.09	0.30	3.70	3.65
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	0.21	0.79	0.77	0.08	0.70	0.70
d, Delay for Lane Group [s/veh]	2.39	2.37	34.91	43.34	42.58	34.05	40.83	40.75
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	0.50	4.28	4.11	0.15	3.67	3.64
50th-Percentile Queue Length [ft/ln]	3.94	3.18	12.60	106.96	102.87	3.85	91.68	91.12
95th-Percentile Queue Length [veh/ln]	0.28	0.23	0.91	7.67	7.41	0.28	6.60	6.56
95th-Percentile Queue Length [ft/ln]	7.09	5.72	22.69	191.76	185.16	6.92	165.02	164.02

Movement, Approach, & Intersection Results

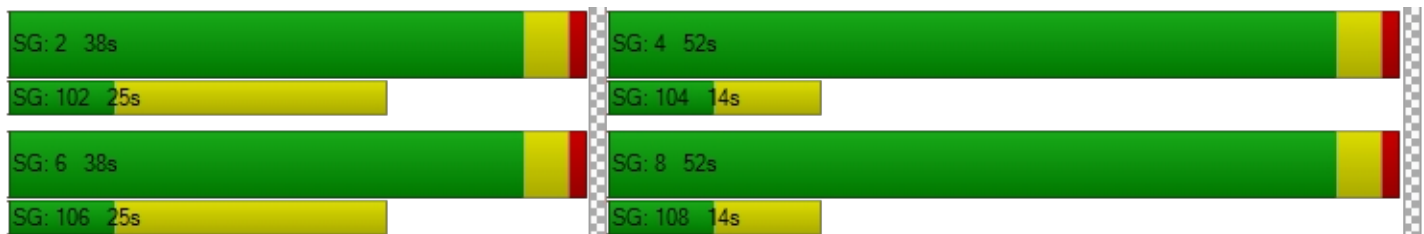
d_M, Delay for Movement [s/veh]	2.39	2.39	2.39	2.37	2.37	2.37	34.91	43.02	42.58	34.05	40.79	40.75
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.39			2.37			42.45			40.64		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.83											
Intersection LOS	D											
Intersection V/C	0.155											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.799			1.804			2.624			2.510		
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]	756			756			1067			1067		
d_b, Bicycle Delay [s]	17.42			17.42			9.80			9.80		
I_b,int, Bicycle LOS Score for Intersection	1.655			1.637			1.895			1.848		
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):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.360

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	30	429	287	75	335	80	55	62	36	74	36	48
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]	30	429	287	75	335	80	55	62	36	74	36	48
Peak Hour Factor	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260
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	130	87	23	101	24	17	19	11	22	11	15
Total Analysis Volume [veh/h]	36	519	347	91	406	97	67	75	44	90	44	58
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 in	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]	20	35	35	10	25	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	59	69	6	61	61	5	8	6	9	9
g / C, Green / Cycle	0.04	0.62	0.73	0.06	0.64	0.64	0.05	0.09	0.06	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.19	0.03	0.11	0.05	0.04	0.07	0.03	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]	68	2245	1313	187	2312	1156	91	154	205	173	173
d1, Uniform Delay [s]	44.80	7.87	4.31	43.41	6.87	6.44	44.37	42.59	42.89	40.05	39.95
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
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
d2, Incremental Delay [s]	6.24	0.24	0.49	1.95	0.17	0.14	10.92	7.91	1.48	0.99	0.88
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	0.53	0.23	0.26	0.49	0.18	0.08	0.74	0.77	0.44	0.31	0.28
d, Delay for Lane Group [s/veh]	51.04	8.12	4.80	45.36	7.03	6.58	55.29	50.50	44.37	41.05	40.83
Lane Group LOS	D	A	A	D	A	A	E	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	1.93	1.61	1.03	1.29	0.60	1.79	2.99	1.03	1.17	1.07
50th-Percentile Queue Length [ft/ln]	22.79	48.21	40.17	25.69	32.18	14.97	44.70	74.81	25.82	29.36	26.81
95th-Percentile Queue Length [veh/ln]	1.64	3.47	2.89	1.85	2.32	1.08	3.22	5.39	1.86	2.11	1.93
95th-Percentile Queue Length [ft/ln]	41.02	86.77	72.30	46.24	57.92	26.94	80.45	134.66	46.47	52.84	48.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.04	8.12	4.80	45.36	7.03	6.58	55.29	50.50	50.50	44.37	41.05	40.86
Movement LOS	D	A	A	D	A	A	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.55			12.83			52.23			42.55		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.73											
Intersection LOS	B											
Intersection V/C	0.360											

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]	37.14			37.14			37.14			37.14		
I_p,int, Pedestrian LOS Score for Intersection	2.846			2.912			2.100			2.608		
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]	653			442			758			737		
d_b, Bicycle Delay [s]	21.56			28.82			18.32			18.95		
I_b,int, Bicycle LOS Score for Intersection	2.304			2.050			1.867			1.876		
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):	8.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.279

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	58	1	44	103	31	36	14	6	0	3	44
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	58	1	44	103	31	36	14	6	0	3	44
Peak Hour Factor	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610
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	19	0	14	34	10	12	5	2	0	1	14
Total Analysis Volume [veh/h]	1	76	1	58	135	41	47	18	8	0	4	58
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	800	840	754	862
Degree of Utilization, x	0.10	0.28	0.10	0.07

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	1.14	0.32	0.23
95th-Percentile Queue Length [ft]	8.08	28.54	8.02	5.80
Approach Delay [s/veh]	7.99	8.94	8.29	7.50
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.47			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	53.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

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]	37	0	191	704	119	103	0	347	74	176	220	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]	37	0	191	704	119	103	0	347	74	176	220	0
Peak Hour Factor	0.9150	0.9150	0.9150	0.9150	0.9150	0.9150	1.0000	0.9150	0.9150	0.9150	0.9150	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	52	192	33	28	0	95	20	48	60	0
Total Analysis Volume [veh/h]	40	0	209	769	130	113	0	379	81	192	240	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 in	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	26	0	59	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]	35	35	35	35	35	18	18	16	38
g / C, Green / Cycle	0.29	0.29	0.29	0.29	0.29	0.15	0.15	0.13	0.31
(v / s)_i Volume / Saturation Flow Rate	0.02	0.12	0.26	0.26	0.06	0.13	0.13	0.11	0.07
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	499	528	499	499	528	269	269	222	1129
d1, Uniform Delay [s]	30.72	33.94	40.79	40.79	32.01	49.81	49.81	51.16	30.32
k, delay calibration	0.50	0.50	0.50	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]	0.31	2.22	22.08	22.08	0.93	7.60	7.60	9.59	0.09
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	0.40	0.90	0.90	0.21	0.85	0.85	0.86	0.21
d, Delay for Lane Group [s/veh]	31.04	36.16	62.87	62.87	32.94	57.41	57.41	60.75	30.41
Lane Group LOS	C	D	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]	0.88	5.16	15.55	15.55	2.60	7.11	7.11	6.10	2.50
50th-Percentile Queue Length [ft/ln]	22.03	129.01	388.85	388.85	65.03	177.77	177.77	152.44	62.56
95th-Percentile Queue Length [veh/ln]	1.59	8.89	22.02	22.02	4.68	11.48	11.48	10.15	4.50
95th-Percentile Queue Length [ft/ln]	39.66	222.15	550.55	550.55	117.06	287.10	287.10	253.68	112.61

Movement, Approach, & Intersection Results

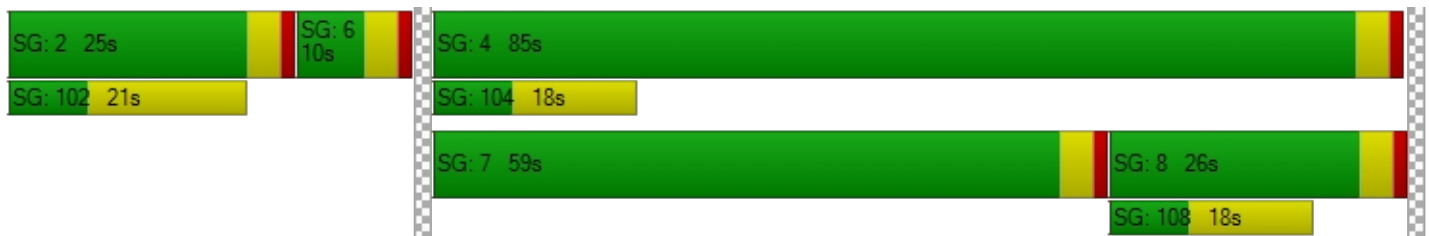
d_M, Delay for Movement [s/veh]	31.04	0.00	36.16	62.87	62.87	32.94	0.00	57.41	57.41	60.75	30.41	0.00
Movement LOS	C		D	E	E	C		E	E	E	C	
d_A, Approach Delay [s/veh]	35.34			59.53				57.41		43.89		
Approach LOS	D			E				E		D		
d_I, Intersection Delay [s/veh]	53.14											
Intersection LOS	D											
Intersection V/C	0.690											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.201		2.433		2.457		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		367		1350
d_b, Bicycle Delay [s]	54.15		40.84		40.02		6.34
I_b,int, Bicycle LOS Score for Intersection	1.560		3.229		1.939		1.916
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):	10.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.328

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]	174	37	66	493	415	73
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]	174	37	66	493	415	73
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	11	19	140	118	21
Total Analysis Volume [veh/h]	198	42	75	562	473	83
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 in	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	0.12	0.02	0.04	0.16	0.15	0.15
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	241	255	1309	2769	1201	1201
d1, Uniform Delay [s]	37.52	33.94	2.51	2.84	5.90	5.90
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.80	0.30	0.08	0.17	0.45	0.45
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	0.16	0.06	0.20	0.23	0.23
d, Delay for Lane Group [s/veh]	44.32	34.24	2.59	3.01	6.35	6.35
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.67	0.83	0.20	0.80	1.71	1.71
50th-Percentile Queue Length [ft/ln]	116.75	20.75	5.08	19.91	42.70	42.70
95th-Percentile Queue Length [veh/ln]	8.21	1.49	0.37	1.43	3.07	3.07
95th-Percentile Queue Length [ft/ln]	205.36	37.35	9.14	35.84	76.85	76.85

Movement, Approach, & Intersection Results

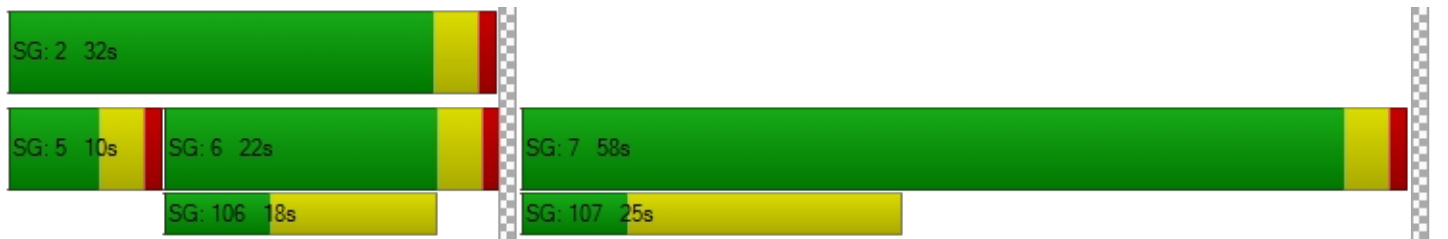
d_M, Delay for Movement [s/veh]	44.32	34.24	2.59	3.01	6.35	6.35
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.56		2.96		6.35	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.91					
Intersection LOS	B					
Intersection V/C	0.328					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.121	2.636	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.085	2.018
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):	39.7
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	+			+			T			T		
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]	43	2	90	2	0	6	10	468	108	118	314	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]	43	2	90	2	0	6	10	468	108	118	314	11
Peak Hour Factor	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820
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	26	1	0	2	3	133	31	33	89	3
Total Analysis Volume [veh/h]	49	2	102	2	0	7	11	531	122	134	356	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	0.31	0.01	0.15	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]	38.03	39.74	20.37	26.63	31.89	9.52	8.06	0.00	0.00	9.52	0.00	0.00
Movement LOS	E	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.47	2.47	2.47	0.06	0.06	0.06	0.03	0.00	0.00	0.50	0.00	0.00
95th-Percentile Queue Length [ft/ln]	61.81	61.81	61.81	1.56	1.56	1.56	0.70	0.00	0.00	12.57	0.00	0.00
d_A, Approach Delay [s/veh]	26.28			13.33			0.13			2.54		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	4.15											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.311

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	60	6	17	2	8	33	52	515	153	10	371	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]	60	6	17	2	8	33	52	515	153	10	371	6
Peak Hour Factor	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530
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	10	15	151	45	3	109	2
Total Analysis Volume [veh/h]	70	7	20	2	9	39	61	604	179	12	435	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 in	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	0.65	0.65	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	0.23	0.21	0.01	0.12	0.12
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1177	1149	307	467	467	119	467	467
d1, Uniform Delay [s]	5.78	5.62	25.56	31.84	31.15	24.82	28.10	28.08
k, delay calibration	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
d2, Incremental Delay [s]	0.14	0.07	0.31	5.20	3.32	0.36	0.75	0.74
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	0.81	0.10	0.47	0.47
d, Delay for Lane Group [s/veh]	5.92	5.69	25.87	37.04	34.47	25.18	28.85	28.83
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]	0.60	0.30	0.97	8.52	7.52	0.19	3.86	3.85
50th-Percentile Queue Length [ft/ln]	14.95	7.49	24.27	213.05	188.04	4.81	96.61	96.17
95th-Percentile Queue Length [veh/ln]	1.08	0.54	1.75	13.31	12.02	0.35	6.96	6.92
95th-Percentile Queue Length [ft/ln]	26.91	13.48	43.69	332.73	300.49	8.66	173.91	173.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.92	5.92	5.92	5.69	5.69	5.69	25.87	36.21	34.47	25.18	28.84	28.83
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.92			5.69			35.09			28.74		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.12											
Intersection LOS	C											
Intersection V/C	0.311											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.924			1.882			2.805			2.618		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.720			1.642			2.256			1.934		
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):	33.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	34	216	166	41	533	12	2	34	72	897	105	141
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]	34	216	166	41	533	12	2	34	72	897	105	141
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
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	56	43	11	138	3	1	9	19	232	27	37
Total Analysis Volume [veh/h]	35	224	172	42	552	12	2	35	75	930	109	146
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 in	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]	20	35	35	10	25	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	53	94	5	53	53	0	9	37	46	46
g / C, Green / Cycle	0.03	0.44	0.79	0.04	0.44	0.44	0.00	0.08	0.31	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.02	0.06	0.10	0.01	0.15	0.01	0.00	0.06	0.29	0.07	0.07
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	1700	1800	3200	1800	1800
c, Capacity [veh/h]	60	1587	1412	123	1599	799	7	139	992	689	689
d1, Uniform Delay [s]	57.04	20.01	3.09	56.23	21.91	18.67	59.60	54.46	40.27	24.59	24.59
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
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
d2, Incremental Delay [s]	8.65	0.19	0.18	1.62	0.59	0.03	19.99	9.70	4.96	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	0.58	0.14	0.12	0.34	0.35	0.02	0.28	0.79	0.94	0.18	0.18
d, Delay for Lane Group [s/veh]	65.69	20.19	3.26	57.85	22.50	18.71	79.59	64.16	45.24	24.72	24.72
Lane Group LOS	E	C	A	E	C	B	E	E	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.16	1.81	0.71	0.62	4.85	0.18	0.10	3.59	13.58	2.39	2.39
50th-Percentile Queue Length [ft/ln]	28.97	45.28	17.77	15.62	121.34	4.57	2.49	89.73	339.39	59.72	59.72
95th-Percentile Queue Length [veh/ln]	2.09	3.26	1.28	1.12	8.47	0.33	0.18	6.46	19.62	4.30	4.30
95th-Percentile Queue Length [ft/ln]	52.14	81.50	31.98	28.11	211.67	8.22	4.48	161.51	490.46	107.49	107.49

Movement, Approach, & Intersection Results

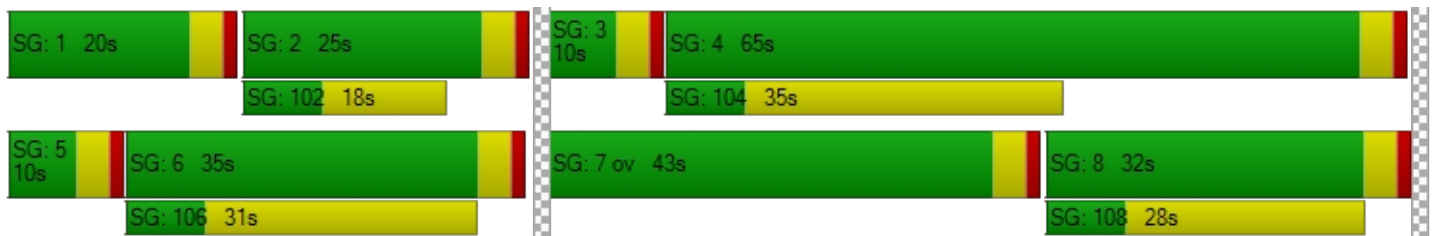
d_M, Delay for Movement [s/veh]	65.69	20.19	3.26	57.85	22.50	18.71	79.59	64.16	64.16	45.24	24.72	24.72
Movement LOS	E	C	A	E	C	B	E	E	E	D	C	C
d_A, Approach Delay [s/veh]	17.13			24.87			64.43			40.82		
Approach LOS	B			C			E			D		
d_I, Intersection Delay [s/veh]	33.44											
Intersection LOS	C											
Intersection V/C	0.607											

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]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersection	3.005			2.857			2.070			2.777		
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			350			467			1017		
d_b, Bicycle Delay [s]	33.00			40.84			35.27			14.50		
I_b,int, Bicycle LOS Score for Intersection	1.915			2.060			1.744			3.515		
Bicycle LOS	A			B			A			D		

Sequence

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



APPENDIX C-III

**EXISTING WITH PROJECT WITH MITIGATION
TRAFFIC CONDITIONS**

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

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	44	0	175	7	0	7	7	264	42	68	268	10
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]	44	0	175	7	0	7	7	264	42	68	268	10
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
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]	13	0	51	2	0	2	2	77	12	20	78	3
Total Analysis Volume [veh/h]	51	0	204	8	0	8	8	307	49	79	312	12
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 in	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	8	0	0	4	0	0	2	0	0	6	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	57	0	0	57	0	0	33	0	0	33	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]	17	17	65	65	65	65	65	65
g / C, Green / Cycle	0.19	0.19	0.73	0.73	0.73	0.73	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.16	0.01	0.01	0.10	0.10	0.08	0.09	0.09
s, saturation flow rate [veh/h]	1571	1097	1056	1870	1782	1025	1870	1846
c, Capacity [veh/h]	339	263	780	1357	1294	756	1357	1340
d1, Uniform Delay [s]	35.46	30.07	5.14	3.73	3.74	5.65	3.69	3.69
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.40	0.10	0.02	0.20	0.22	0.28	0.18	0.18
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	0.75	0.06	0.01	0.13	0.14	0.10	0.12	0.12
d, Delay for Lane Group [s/veh]	38.86	30.16	5.17	3.93	3.95	5.93	3.87	3.87
Lane Group LOS	D	C	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	5.62	0.29	0.04	0.73	0.72	0.48	0.65	0.65
50th-Percentile Queue Length [ft/ln]	140.57	7.22	1.11	18.34	17.93	12.06	16.33	16.22
95th-Percentile Queue Length [veh/ln]	9.51	0.52	0.08	1.32	1.29	0.87	1.18	1.17
95th-Percentile Queue Length [ft/ln]	237.80	12.99	2.00	33.01	32.28	21.71	29.40	29.20

Movement, Approach, & Intersection Results

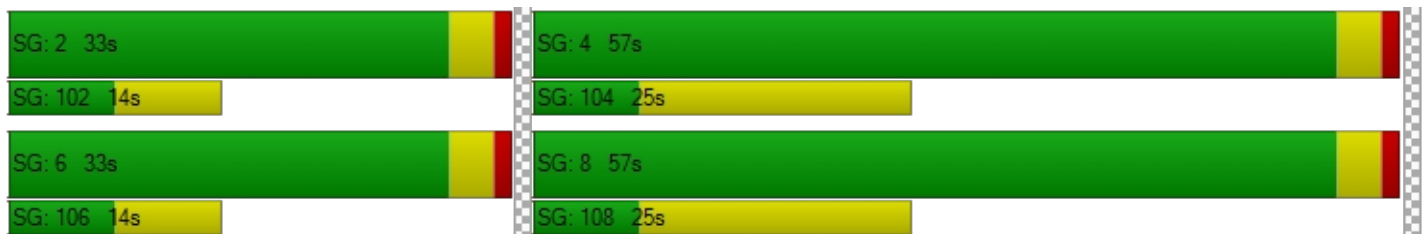
d_M, Delay for Movement [s/veh]	38.86	38.86	38.86	30.16	30.16	30.16	5.17	3.94	3.95	5.93	3.87	3.87
Movement LOS	D	D	D	C	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	38.86			30.16			3.97			4.28		
Approach LOS	D			C			A			A		
d_I, Intersection Delay [s/veh]	13.06											
Intersection LOS	B											
Intersection V/C	0.286											

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]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.013	1.743	2.587	2.580
Crosswalk LOS	B	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]	1178	1178	644	644
d_b, Bicycle Delay [s]	7.61	7.61	20.67	20.67
I_b,int, Bicycle LOS Score for Intersection	1.980	1.586	1.860	1.892
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 4: Twin Knolls Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	7.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.306

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	43	2	90	2	0	6	10	468	108	118	314	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
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	90	2	0	6	10	468	108	118	314	11
Peak Hour Factor	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820
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	26	1	0	2	3	133	31	33	89	3
Total Analysis Volume [veh/h]	49	2	102	2	0	7	11	531	122	134	356	12
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 in	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	8	0	0	4	0	0	2	0	0	6	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	72	0	0	72	0	0	18	0	0	18	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]	11	11	71	71	71	71	71	71
g / C, Green / Cycle	0.12	0.12	0.79	0.79	0.79	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.10	0.01	0.01	0.18	0.18	0.17	0.10	0.10
s, saturation flow rate [veh/h]	1564	1690	1014	1870	1751	779	1870	1849
c, Capacity [veh/h]	239	250	825	1481	1387	634	1481	1464
d1, Uniform Delay [s]	38.55	35.06	3.21	2.37	2.37	4.55	2.15	2.16
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.85	0.06	0.03	0.36	0.38	0.76	0.17	0.18
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	0.64	0.04	0.01	0.23	0.23	0.21	0.12	0.13
d, Delay for Lane Group [s/veh]	41.40	35.12	3.24	2.72	2.75	5.31	2.33	2.33
Lane Group LOS	D	D	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.43	0.18	0.04	0.81	0.77	0.73	0.40	0.40
50th-Percentile Queue Length [ft/ln]	85.75	4.43	1.02	20.28	19.37	18.14	10.09	10.03
95th-Percentile Queue Length [veh/ln]	6.17	0.32	0.07	1.46	1.39	1.31	0.73	0.72
95th-Percentile Queue Length [ft/ln]	154.35	7.97	1.84	36.50	34.87	32.66	18.17	18.05

Movement, Approach, & Intersection Results

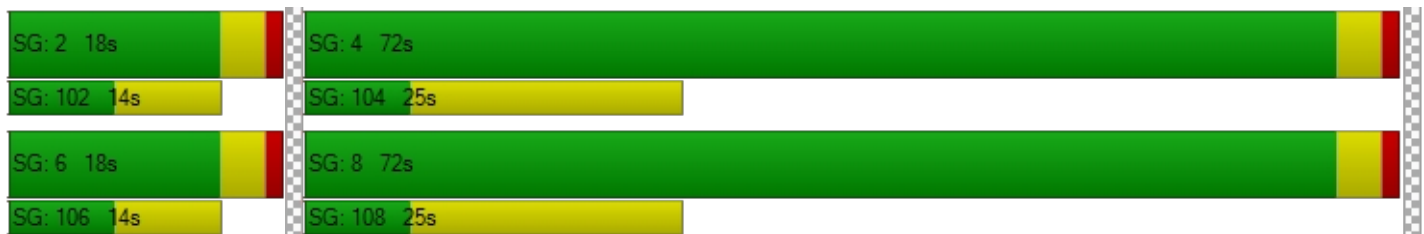
d_M, Delay for Movement [s/veh]	41.40	41.40	41.40	35.12	35.12	35.12	3.24	2.74	2.75	5.31	2.33	2.33
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	41.40			35.12			2.75			3.12		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	7.56											
Intersection LOS	A											
Intersection V/C	0.306											

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]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.104	1.747	2.684	2.635
Crosswalk LOS	B	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]	1511	1511	311	311
d_b, Bicycle Delay [s]	2.69	2.69	32.09	32.09
I_b,int, Bicycle LOS Score for Intersection	1.812	1.574	2.107	1.974
Bicycle LOS	A	A	B	A

Sequence

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



APPENDIX D
YEAR 2040 MODELING WORKSHEETS

1. Shady View Drive at Mystic Canyon Drive

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU RIGHT	2 14 0	NORTHBOUND IN ... OUT ...	16 12
SOUTH BOUND	LEFT THRU RIGHT	27 12 66	SOUTHBOUND IN ... OUT ...	105 157
EAST BOUND	LEFT THRU RIGHT	66 10 0	EASTBOUND IN ... OUT ...	76 74
WEST BOUND	LEFT THRU RIGHT	0 6 77	WESTBOUND IN ... OUT ...	83 37

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU RIGHT	2 14 0	2 17 0
SOUTH BOUND	LEFT THRU RIGHT	27 12 66	30 15 74
EAST BOUND	LEFT THRU RIGHT	66 10 0	74 12 0
WEST BOUND	LEFT THRU RIGHT	0 6 77	0 6 86

2. Shady View Drive at Butterfield Ranch Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	33	NORTHBOUND	
	THRU	0	IN ...	317
	RIGHT	284	OUT ...	247
SOUTH BOUND	LEFT	243	SOUTHBOUND	
	THRU	17	IN ...	263
	RIGHT	32	OUT ...	0
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	736	IN ...	792
	RIGHT	24	OUT ...	449
WEST BOUND	LEFT	206	WESTBOUND	
	THRU	302	IN ...	901
	RIGHT	0	OUT ...	1577

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	33	41
	THRU	0	0
	RIGHT	284	363
SOUTH BOUND	LEFT	243	300
	THRU	17	19
	RIGHT	32	36
EAST BOUND	LEFT	0	0
	THRU	736	913
	RIGHT	24	29
WEST BOUND	LEFT	206	245
	THRU	302	446
	RIGHT	0	0

3. Brookwood Lane at Butterfield Ranch Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU RIGHT	0 0 0	NORTHBOUND IN ... OUT ...	0 0
SOUTH BOUND	LEFT THRU RIGHT	264 0 42	SOUTHBOUND IN ... OUT ...	306 96
EAST BOUND	LEFT THRU RIGHT	49 404 0	EASTBOUND IN ... OUT ...	512 396
WEST BOUND	LEFT THRU RIGHT	0 279 47	WESTBOUND IN ... OUT ...	401 727

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU RIGHT	0 0 0	0 0 0
SOUTH BOUND	LEFT THRU RIGHT	264 0 42	294 0 48
EAST BOUND	LEFT THRU RIGHT	49 404 0	56 478 0
WEST BOUND	LEFT THRU RIGHT	0 279 47	0 353 53

4. Twin Knolls Drive at Butterfield Ranch Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU RIGHT	35 0 166	NORTHBOUND IN ... OUT ...	201 105
SOUTH BOUND	LEFT THRU RIGHT	7 0 7	SOUTHBOUND IN ... OUT ...	14 17
EAST BOUND	LEFT THRU RIGHT	7 262 37	EASTBOUND IN ... OUT ...	365 376
WEST BOUND	LEFT THRU RIGHT	68 259 10	WESTBOUND IN ... OUT ...	412 494

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU RIGHT	35 0 166	43 0 185
SOUTH BOUND	LEFT THRU RIGHT	7 0 7	7 0 8
EAST BOUND	LEFT THRU RIGHT	7 262 37	8 328 44
WEST BOUND	LEFT THRU RIGHT	68 259 10	76 333 12

5. Mystic Canyon Drive at Butterfield Ranch Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU	47 0	NORTHBOUND IN ...	49
	RIGHT	2	OUT ...	46
SOUTH BOUND	LEFT THRU	5 0	SOUTHBOUND IN ...	40
	RIGHT	35	OUT ...	29
EAST BOUND	LEFT THRU	22 276	EASTBOUND IN ...	396
	RIGHT	39	OUT ...	421
WEST BOUND	LEFT THRU	7 264	WESTBOUND IN ...	353
	RIGHT	7	OUT ...	342

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU	47 0	57 0
	RIGHT	2	2
SOUTH BOUND	LEFT THRU	5 0	5 0
	RIGHT	35	41
EAST BOUND	LEFT THRU	22 276	25 348
	RIGHT	39	46
WEST BOUND	LEFT THRU	7 264	7 339
	RIGHT	7	7

6. Butterfield Ranch Road at Pine Avenue

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU RIGHT	30 411 287	NORTHBOUND IN ... OUT ...	735 490
SOUTH BOUND	LEFT THRU RIGHT	75 329 80	SOUTHBOUND IN ... OUT ...	608 924
EAST BOUND	LEFT THRU RIGHT	55 62 36	EASTBOUND IN ... OUT ...	153 146
WEST BOUND	LEFT THRU RIGHT	74 36 48	WESTBOUND IN ... OUT ...	343 280

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU RIGHT	30 411 287	34 600 441
SOUTH BOUND	LEFT THRU RIGHT	75 329 80	115 413 95
EAST BOUND	LEFT THRU RIGHT	55 62 36	102 69 40
WEST BOUND	LEFT THRU RIGHT	74 36 48	153 40 222

1. Shady View Drive at Mystic Canyon Drive

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU	1	NORTHBOUND	
	RIGHT	12	IN ...	14
		1	OUT ...	25
SOUTH BOUND	LEFT THRU	44	SOUTHBOUND	
	RIGHT	19	IN ...	94
		31	OUT ...	92
EAST BOUND	LEFT THRU	36	EASTBOUND	
	RIGHT	14	IN ...	56
		6	OUT ...	35
WEST BOUND	LEFT THRU	0	WESTBOUND	
	RIGHT	3	IN ...	47
		44	OUT ...	59

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU	1	1
	RIGHT	12	15
		1	1
SOUTH BOUND	LEFT THRU	44	49
	RIGHT	19	22
		31	35
EAST BOUND	LEFT THRU	36	40
	RIGHT	14	16
		6	6
WEST BOUND	LEFT THRU	0	0
	RIGHT	3	3
		44	49

2. Shady View Drive at Butterfield Ranch Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU	31 0	NORTHBOUND IN ...	181
	RIGHT	150	OUT ...	284
SOUTH BOUND	LEFT THRU	704 89	SOUTHBOUND IN ...	1176
	RIGHT	103	OUT ...	0
EAST BOUND	LEFT THRU	0 341	EASTBOUND IN ...	477
	RIGHT	69	OUT ...	287
WEST BOUND	LEFT THRU	126 220	WESTBOUND IN ...	477
	RIGHT	0	OUT ...	1739

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU	31 0	38 0
	RIGHT	150	175
SOUTH BOUND	LEFT THRU	704 89	1,110 99
	RIGHT	103	114
EAST BOUND	LEFT THRU	0 341	0 453
	RIGHT	69	81
WEST BOUND	LEFT THRU	126 220	212 301
	RIGHT	0	0

3. Brookwood Lane at Butterfield Ranch Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU	0	NORTHBOUND IN ...	0
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT THRU	174	SOUTHBOUND IN ...	211
	RIGHT	37	OUT ...	139
EAST BOUND	LEFT THRU	66	EASTBOUND IN ...	624
	RIGHT	482	OUT ...	406
WEST BOUND	LEFT THRU	0	WESTBOUND IN ...	442
	RIGHT	409	OUT ...	732
		73		

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT THRU	174	193
	RIGHT	0	0
		37	42
EAST BOUND	LEFT THRU	66	71
	RIGHT	482	555
		0	0
WEST BOUND	LEFT THRU	0	0
	RIGHT	409	517
		73	81

4. Twin Knolls Drive at Butterfield Ranch Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	37	NORTHBOUND	
	THRU	2	IN ...	123
	RIGHT	84	OUT ...	211
SOUTH BOUND	LEFT	2	SOUTHBOUND	
	THRU	0	IN ...	8
	RIGHT	6	OUT ...	23
EAST BOUND	LEFT	10	EASTBOUND	
	THRU	463	IN ...	642
	RIGHT	93	OUT ...	311
WEST BOUND	LEFT	118	WESTBOUND	
	THRU	308	IN ...	397
	RIGHT	11	OUT ...	625

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	37	44
	THRU	2	2
	RIGHT	84	93
SOUTH BOUND	LEFT	2	2
	THRU	0	0
	RIGHT	6	7
EAST BOUND	LEFT	10	13
	THRU	463	534
	RIGHT	93	108
WEST BOUND	LEFT	118	131
	THRU	308	404
	RIGHT	11	13

5. Mystic Canyon Drive at Butterfield Ranch Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU	60	NORTHBOUND	
	RIGHT	6	IN ...	83
		17	OUT ...	171
SOUTH BOUND	LEFT THRU	2	SOUTHBOUND	
	RIGHT	8	IN ...	43
		33	OUT ...	64
EAST BOUND	LEFT THRU	52	EASTBOUND	
	RIGHT	495	IN ...	776
		153	OUT ...	412
WEST BOUND	LEFT THRU	10	WESTBOUND	
	RIGHT	359	IN ...	335
		6	OUT ...	590

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU	60	70
	RIGHT	6	6
		17	18
SOUTH BOUND	LEFT THRU	2	2
	RIGHT	8	8
		33	38
EAST BOUND	LEFT THRU	52	60
	RIGHT	495	572
		153	174
WEST BOUND	LEFT THRU	10	12
	RIGHT	359	466
		6	6

6. Butterfield Ranch Road at Pine Avenue

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86

Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT THRU	34 204	NORTHBOUND IN ...	475
	RIGHT	166	OUT ...	1,633
SOUTH BOUND	LEFT THRU	41 513	SOUTHBOUND IN ...	799
	RIGHT	12	OUT ...	556
EAST BOUND	LEFT THRU	2 34	EASTBOUND IN ...	108
	RIGHT	72	OUT ...	151
WEST BOUND	LEFT THRU	897 105	WESTBOUND IN ...	1,325
	RIGHT	141	OUT ...	367

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES

NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)

*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT THRU	34 204	38 310
	RIGHT	166	344
SOUTH BOUND	LEFT THRU	41 513	112 670
	RIGHT	12	17
EAST BOUND	LEFT THRU	2 34	3 52
	RIGHT	72	80
WEST BOUND	LEFT THRU	897 105	1,192 113
	RIGHT	141	301

APPENDIX E

YEAR 2024 TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX E-1

**YEAR 2024 WITHOUT PROJECT
TRAFFIC CONDITIONS**

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):	0.134

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	16	0	29	14	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	16	0	29	14	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	4	0	8	4	18	18	3	0	0	2	22
Total Analysis Volume [veh/h]	2	17	0	31	15	74	74	12	0	0	6	86
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	806	895	801	955
Degree of Utilization, x	0.02	0.13	0.11	0.10

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.07	0.46	0.36	0.32
95th-Percentile Queue Length [ft]	1.81	11.56	8.99	7.97
Approach Delay [s/veh]	7.57	7.65	8.04	7.17
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.61			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	42.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

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]	39	0	301	258	18	34	0	800	28	218	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]	39	0	301	258	18	34	0	800	28	218	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]	10	0	79	68	5	9	0	211	7	57	88	0
Total Analysis Volume [veh/h]	41	0	317	272	19	36	0	842	29	229	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 in	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]	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]	23	23	0	0	26	0	0	27	0	19	46	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	
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	L	R	L	C	R	C	C	L	C
C, Cycle Length [s]	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
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]	19	19	19	19	19	26	26	15	44
g / C, Green / Cycle	0.20	0.20	0.20	0.20	0.20	0.27	0.27	0.16	0.47
(v / s)_i Volume / Saturation Flow Rate	0.02	0.18	0.09	0.09	0.02	0.24	0.24	0.13	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	344	364	344	344	364	485	485	268	1688
d1, Uniform Delay [s]	31.01	36.73	33.09	33.10	30.88	33.52	33.52	39.02	14.87
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.28	0.28	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]	0.71	23.53	3.76	3.79	0.54	14.09	14.09	7.63	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	0.12	0.87	0.42	0.42	0.10	0.90	0.90	0.85	0.21
d, Delay for Lane Group [s/veh]	31.72	60.26	36.84	36.89	31.42	47.61	47.61	46.65	14.93
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]	0.82	9.28	3.21	3.23	0.71	10.94	10.94	5.52	2.06
50th-Percentile Queue Length [ft/ln]	20.53	232.12	80.13	80.65	17.84	273.61	273.61	137.90	51.50
95th-Percentile Queue Length [veh/ln]	1.48	14.28	5.77	5.81	1.28	16.37	16.37	9.37	3.71
95th-Percentile Queue Length [ft/ln]	36.96	357.06	144.23	145.17	32.12	409.25	409.25	234.20	92.71

Movement, Approach, & Intersection Results

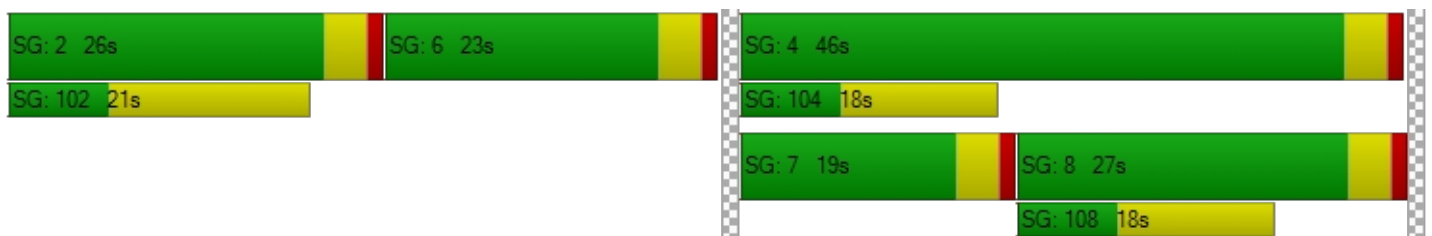
d_M, Delay for Movement [s/veh]	31.72	0.00	60.26	36.87	36.89	31.42	0.00	47.61	47.61	46.65	14.93	0.00
Movement LOS	C		E	D	D	C		D	D	D	B	
d_A, Approach Delay [s/veh]	56.99			36.27				47.61		27.43		
Approach LOS	E			D				D		C		
d_I, Intersection Delay [s/veh]	41.96											
Intersection LOS	D											
Intersection V/C	0.731											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	37.14		37.14		37.14		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.183		2.226		2.609		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]	400		463		484		884
d_b, Bicycle Delay [s]	30.40		28.05		27.28		14.78
I_b,int, Bicycle LOS Score for Intersection	1.560		2.099		2.278		2.039
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):	0.353

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	452	314	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	452	314	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	119	83	13
Total Analysis Volume [veh/h]	295	48	56	476	331	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 in	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	1239	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
l, 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	7.80	7.80
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	1.06	1.40	1.40
50th-Percentile Queue Length [ft/ln]	170.74	21.81	5.88	26.48	35.05	35.05
95th-Percentile Queue Length [veh/ln]	11.12	1.57	0.42	1.91	2.52	2.52
95th-Percentile Queue Length [ft/ln]	277.89	39.25	10.59	47.67	63.09	63.09

Movement, Approach, & Intersection Results

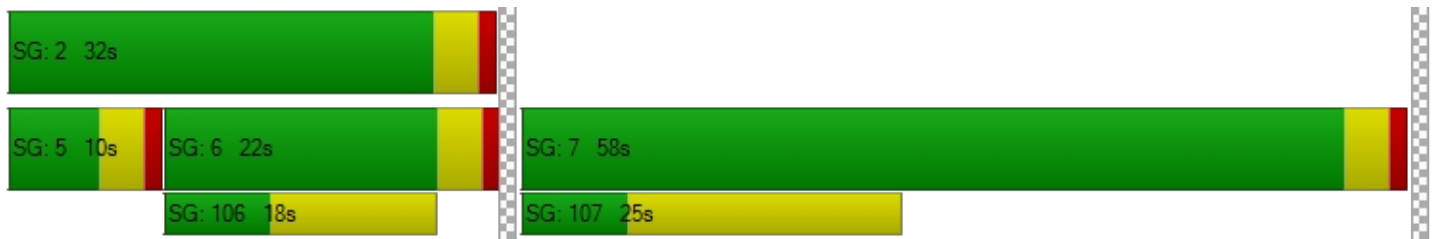
d_M, Delay for Movement [s/veh]	41.60	29.77	3.95	4.49	7.80	7.80
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.95		4.43		7.80	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.13					
Intersection LOS	B					
Intersection V/C	0.353					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.113	2.566	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	1.999	1.876
Bicycle LOS	A	A	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):	19.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.132

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	41	0	176	7	0	8	8	302	42	72	293	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]	41	0	176	7	0	8	8	302	42	72	293	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]	11	0	46	2	0	2	2	79	11	19	77	3
Total Analysis Volume [veh/h]	43	0	185	7	0	8	8	318	44	76	308	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	0.13	0.00	0.22	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]	19.10	20.74	12.38	18.93	18.29	9.52	7.93	0.00	0.00	8.22	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.60	1.60	1.60	0.11	0.11	0.11	0.02	0.00	0.00	0.20	0.00	0.00
95th-Percentile Queue Length [ft/ln]	40.01	40.01	40.01	2.78	2.78	2.78	0.49	0.00	0.00	5.09	0.00	0.00
d_A, Approach Delay [s/veh]	13.65			13.91			0.17			1.58		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.97											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.157

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	322	44	7	303	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	322	44	7	303	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	80	2
Total Analysis Volume [veh/h]	57	0	2	5	0	41	25	339	46	7	319	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 in	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]	1395	1361	136	246	246	105	246	246
d1, Uniform Delay [s]	2.37	2.35	33.98	37.55	37.43	33.62	36.82	36.80
k, delay calibration	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
d2, Incremental Delay [s]	0.06	0.05	0.64	5.73	5.09	0.26	3.07	3.03
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	0.18	0.79	0.77	0.07	0.66	0.66
d, Delay for Lane Group [s/veh]	2.43	2.40	34.62	43.28	42.52	33.88	39.89	39.83
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	4.33	4.17	0.13	3.44	3.42
50th-Percentile Queue Length [ft/ln]	4.06	3.15	12.02	108.30	104.16	3.36	86.07	85.62
95th-Percentile Queue Length [veh/ln]	0.29	0.23	0.87	7.75	7.50	0.24	6.20	6.16
95th-Percentile Queue Length [ft/ln]	7.31	5.68	21.64	193.63	187.50	6.04	154.92	154.12

Movement, Approach, & Intersection Results

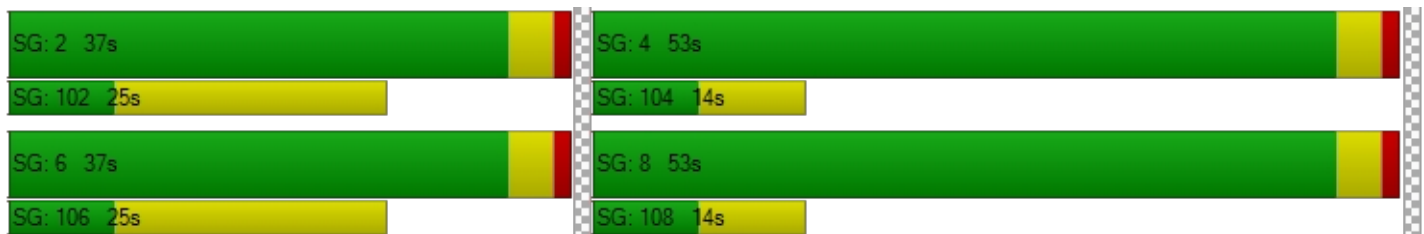
d_M, Delay for Movement [s/veh]	2.43	2.43	2.43	2.40	2.40	2.40	34.62	42.96	42.52	33.88	39.86	39.83
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.43			2.40			42.40			39.73		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.40											
Intersection LOS	D											
Intersection V/C	0.157											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.797			1.801			2.622			2.505		
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]	733			733			1089			1089		
d_b, Bicycle Delay [s]	18.05			18.05			9.34			9.34		
I_b,int, Bicycle LOS Score for Intersection	1.657			1.636			1.898			1.834		
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	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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	479	420	87	387	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	479	420	87	387	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	126	111	23	102	22	15	17	10	38	10	16
Total Analysis Volume [veh/h]	34	504	442	92	407	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 in	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	7.58	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
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
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	7.80	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	1.81	2.10	1.04	1.24	0.53	1.60	2.76	1.89	1.19	1.08
50th-Percentile Queue Length [ft/ln]	21.56	45.34	52.44	25.98	31.07	13.17	40.09	69.02	47.16	29.73	26.93
95th-Percentile Queue Length [veh/ln]	1.55	3.26	3.78	1.87	2.24	0.95	2.89	4.97	3.40	2.14	1.94
95th-Percentile Queue Length [ft/ln]	38.80	81.60	94.40	46.77	55.93	23.71	72.17	124.24	84.89	53.51	48.47

Movement, Approach, & Intersection Results

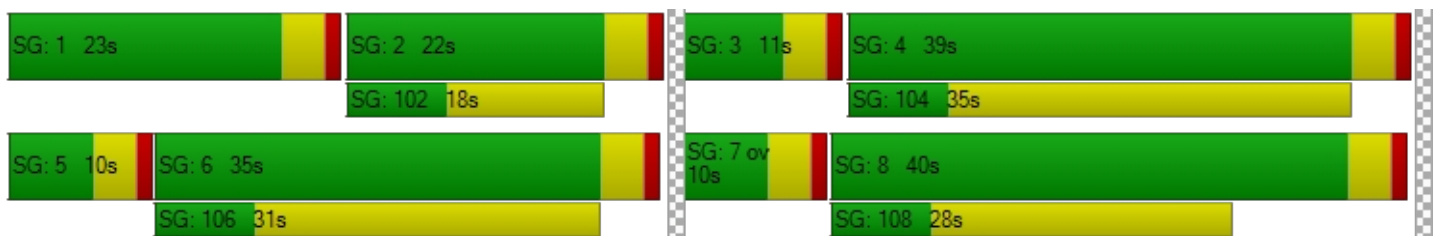
d_M, Delay for Movement [s/veh]	51.02	7.80	5.07	45.39	6.74	6.26	53.77	51.14	51.14	49.26	41.59	41.39
Movement LOS	D	A	A	D	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.07			12.71			52.08			46.16		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	18.08											
Intersection LOS	B											
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 [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]	37.14			37.14			37.14			37.14		
I_p,int, Pedestrian LOS Score for Intersection	2.883			2.906			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]	653			379			758			737		
d_b, Bicycle Delay [s]	21.56			31.21			18.32			18.95		
I_b,int, Bicycle LOS Score for Intersection	2.368			2.045			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):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.120

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	14	1	47	21	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	14	1	47	21	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	4	0	12	6	9	10	4	2	0	1	12
Total Analysis Volume [veh/h]	1	15	1	49	22	35	40	16	6	0	3	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	846	881	834	973
Degree of Utilization, x	0.02	0.12	0.07	0.05

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.06	0.41	0.24	0.17
95th-Percentile Queue Length [ft]	1.54	10.22	6.01	4.23
Approach Delay [s/veh]	7.34	7.64	7.67	6.91
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.47			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	49.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

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]	36	0	159	746	94	109	0	383	77	134	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]	36	0	159	746	94	109	0	383	77	134	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]	9	0	42	196	25	29	0	101	20	35	68	0
Total Analysis Volume [veh/h]	38	0	167	785	99	115	0	403	81	141	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 in	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]	22	22	0	0	52	0	0	22	0	24	46	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	
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	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]	37	37	37	37	37	19	19	12	35
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.16	0.16	0.10	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.09	0.26	0.26	0.06	0.13	0.13	0.08	0.08
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	519	549	519	519	549	281	281	171	1044
d1, Uniform Delay [s]	29.67	31.97	39.19	39.19	30.98	49.40	49.40	53.01	32.78
k, delay calibration	0.50	0.50	0.50	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]	0.27	1.43	16.11	16.11	0.87	7.82	7.82	9.69	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
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	0.07	0.30	0.85	0.85	0.21	0.86	0.86	0.83	0.26
d, Delay for Lane Group [s/veh]	29.94	33.40	55.30	55.30	31.85	57.22	57.22	62.70	32.91
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]	0.82	3.91	14.30	14.30	2.60	7.49	7.49	4.53	3.01
50th-Percentile Queue Length [ft/ln]	20.47	97.71	357.43	357.43	64.88	187.13	187.13	113.17	75.16
95th-Percentile Queue Length [veh/ln]	1.47	7.04	20.50	20.50	4.67	11.97	11.97	8.02	5.41
95th-Percentile Queue Length [ft/ln]	36.85	175.88	512.45	512.45	116.79	299.30	299.30	200.40	135.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.94	0.00	33.40	55.30	55.30	31.85	0.00	57.22	57.22	62.70	32.91	0.00
Movement LOS	C		C	E	E	C		E	E	E	C	
d_A, Approach Delay [s/veh]	32.75			52.60				57.22		43.03		
Approach LOS	C			D				E		D		
d_I, Intersection Delay [s/veh]	49.84											
Intersection LOS	D											
Intersection V/C	0.633											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.153		2.429		2.478		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]	300		800		300		700
d_b, Bicycle Delay [s]	43.35		21.60		43.35		25.35
I_b,int, Bicycle LOS Score for Intersection	1.560		3.208		1.959		1.902
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):	0.330

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	537	465	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	537	465	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	141	122	20
Total Analysis Volume [veh/h]	194	42	75	565	489	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 in	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	1311	2778	1205	1205
d1, Uniform Delay [s]	37.63	34.13	2.46	2.78	5.84	5.84
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, 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	6.30	6.30
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	0.78	1.74	1.74
50th-Percentile Queue Length [ft/ln]	114.49	20.82	4.96	19.52	43.46	43.46
95th-Percentile Queue Length [veh/ln]	8.09	1.50	0.36	1.41	3.13	3.13
95th-Percentile Queue Length [ft/ln]	202.23	37.48	8.92	35.14	78.22	78.22

Movement, Approach, & Intersection Results

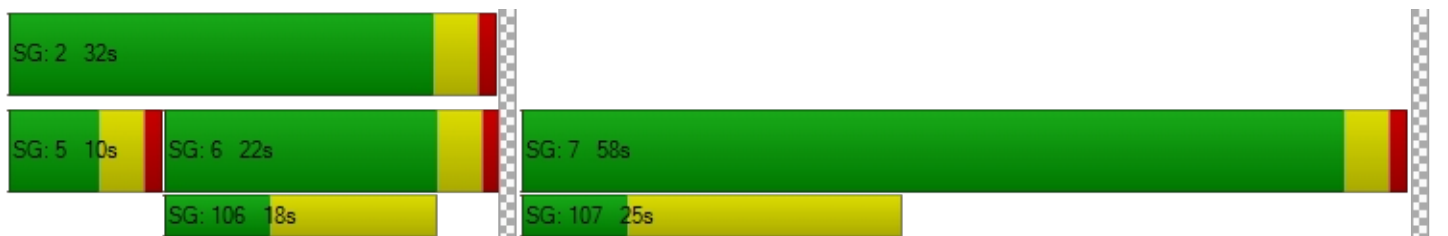
d_M, Delay for Movement [s/veh]	44.43	34.44	2.54	2.95	6.30	6.30
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.66		2.90		6.30	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.73					
Intersection LOS	B					
Intersection V/C	0.330					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.120	2.642	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.088	2.030
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):	39.5
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	+			+			T			T		
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]	42	2	89	2	0	7	12	517	103	125	358	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]	42	2	89	2	0	7	12	517	103	125	358	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]	11	1	23	1	0	2	3	136	27	33	94	3
Total Analysis Volume [veh/h]	44	2	94	2	0	7	13	544	108	132	377	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	0.29	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]	37.50	39.53	19.19	27.35	32.65	9.60	8.12	0.00	0.00	9.51	0.00	0.00
Movement LOS	E	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.18	2.18	2.18	0.06	0.06	0.06	0.03	0.00	0.00	0.49	0.00	0.00
95th-Percentile Queue Length [ft/ln]	54.50	54.50	54.50	1.60	1.60	1.60	0.85	0.00	0.00	12.34	0.00	0.00
d_A, Approach Delay [s/veh]	25.23			13.55			0.16			2.40		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	3.75											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.303

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	556	166	11	417	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	556	166	11	417	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	146	44	3	110	2
Total Analysis Volume [veh/h]	71	6	19	2	8	38	60	585	175	12	439	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 in	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	0.25	0.25	0.25	0.25	0.25	0.25
(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]	1189	1161	292	454	454	118	454	454
d1, Uniform Delay [s]	5.55	5.39	26.02	32.16	31.49	25.28	28.65	28.64
k, delay calibration	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
d2, Incremental Delay [s]	0.13	0.07	0.34	5.24	3.37	0.37	0.82	0.82
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	0.21	0.87	0.80	0.10	0.49	0.49
d, Delay for Lane Group [s/veh]	5.68	5.46	26.36	37.40	34.85	25.65	29.47	29.45
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]	0.57	0.28	0.97	8.30	7.33	0.19	3.94	3.93
50th-Percentile Queue Length [ft/ln]	14.33	6.96	24.16	207.51	183.34	4.86	98.57	98.18
95th-Percentile Queue Length [veh/ln]	1.03	0.50	1.74	13.03	11.77	0.35	7.10	7.07
95th-Percentile Queue Length [ft/ln]	25.80	12.53	43.50	325.64	294.37	8.76	177.43	176.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.68	5.68	5.68	5.46	5.46	5.46	26.36	36.57	34.85	25.65	29.46	29.45
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.68			5.46			35.46			29.36		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.47											
Intersection LOS	C											
Intersection V/C	0.303											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.921			1.878			2.800			2.613		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.718			1.639			2.236			1.937		
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):	60.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.734

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	268	328	51	598	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	268	328	51	598	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	157	3	1	9	20	299	29	41
Total Analysis Volume [veh/h]	38	282	345	54	629	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 in	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	0.17	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	22.07	3.74	55.97	24.17	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
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
d2, Incremental Delay [s]	9.15	0.28	0.42	1.86	0.83	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	0.41	0.02	0.28	0.80	1.15	0.19	0.19
d, Delay for Lane Group [s/veh]	66.12	22.35	4.16	57.83	24.99	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	2.44	1.73	0.80	5.96	0.22	0.10	3.84	25.06	2.55	2.55
50th-Percentile Queue Length [ft/ln]	31.51	61.12	43.23	20.05	149.03	5.59	2.49	95.93	626.50	63.82	63.82
95th-Percentile Queue Length [veh/ln]	2.27	4.40	3.11	1.44	9.97	0.40	0.18	6.91	36.32	4.60	4.60
95th-Percentile Queue Length [ft/ln]	56.72	110.02	77.81	36.08	249.13	10.06	4.48	172.67	907.89	114.88	114.88

Movement, Approach, & Intersection Results

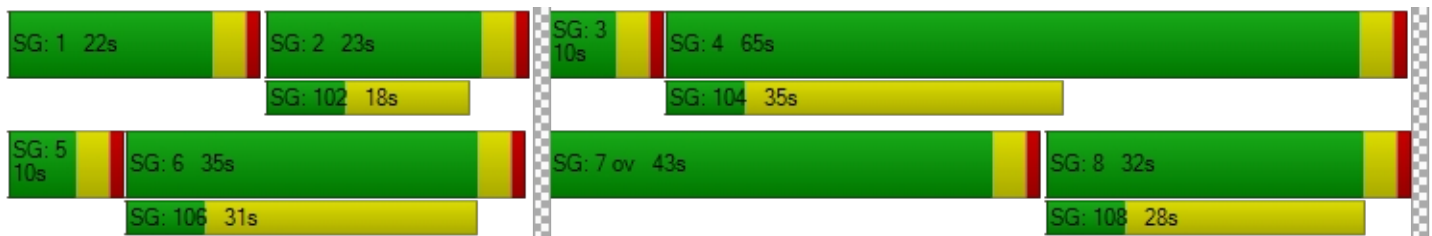
d_M, Delay for Movement [s/veh]	66.12	22.35	4.16	57.83	24.99	20.14	79.59	63.72	63.72	112.16	23.40	23.40
Movement LOS	E	C	A	E	C	C	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	15.42			27.44			63.98			95.26		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	60.06											
Intersection LOS	E											
Intersection V/C	0.734											

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]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersection	3.162			2.900			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			1017		
d_b, Bicycle Delay [s]	33.00			42.50			35.27			14.50		
I_b,int, Bicycle LOS Score for Intersection	2.108			2.135			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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX E-II

YEAR 2024 WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.171

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	86	0	29	40	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	86	0	29	40	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	23	0	8	11	18	18	3	0	0	2	22
Total Analysis Volume [veh/h]	2	91	0	31	42	74	74	12	0	0	6	86
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	799	859	759	895
Degree of Utilization, x	0.12	0.17	0.11	0.10

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.39	0.62	0.38	0.34
95th-Percentile Queue Length [ft]	9.84	15.38	9.55	8.56
Approach Delay [s/veh]	8.10	8.05	8.35	7.48
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.00			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	57.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.771

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]	48	0	363	258	27	34	0	809	30	233	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]	48	0	363	258	27	34	0	809	30	233	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]	13	0	96	68	7	9	0	213	8	61	88	0
Total Analysis Volume [veh/h]	51	0	382	272	28	36	0	852	32	245	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 in	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]	115
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]	31	31	0	0	25	0	0	36	0	23	59	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]	115	115	115	115	115	115	115	115	115
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]	25	25	25	25	25	30	30	19	53
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.22	0.26	0.26	0.16	0.46
(v / s)_i Volume / Saturation Flow Rate	0.03	0.21	0.09	0.09	0.02	0.25	0.25	0.14	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	373	394	373	373	394	467	467	277	1647
d1, Uniform Delay [s]	36.19	44.57	38.49	38.52	35.82	41.83	41.83	47.13	18.79
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.41	0.41	0.12	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]	0.76	38.03	3.20	3.24	0.46	26.35	26.35	10.15	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	0.14	0.97	0.40	0.40	0.09	0.95	0.95	0.88	0.21
d, Delay for Lane Group [s/veh]	36.96	82.60	41.69	41.76	36.28	68.18	68.18	57.28	18.85
Lane Group LOS	D	F	D	D	D	E	E	E	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.23	14.76	3.91	3.94	0.85	15.20	15.20	7.42	2.71
50th-Percentile Queue Length [ft/ln]	30.69	368.97	97.71	98.61	21.31	380.00	380.00	185.61	67.65
95th-Percentile Queue Length [veh/ln]	2.21	21.06	7.03	7.10	1.53	21.59	21.59	11.89	4.87
95th-Percentile Queue Length [ft/ln]	55.24	526.48	175.87	177.51	38.36	539.85	539.85	297.32	121.77

Movement, Approach, & Intersection Results

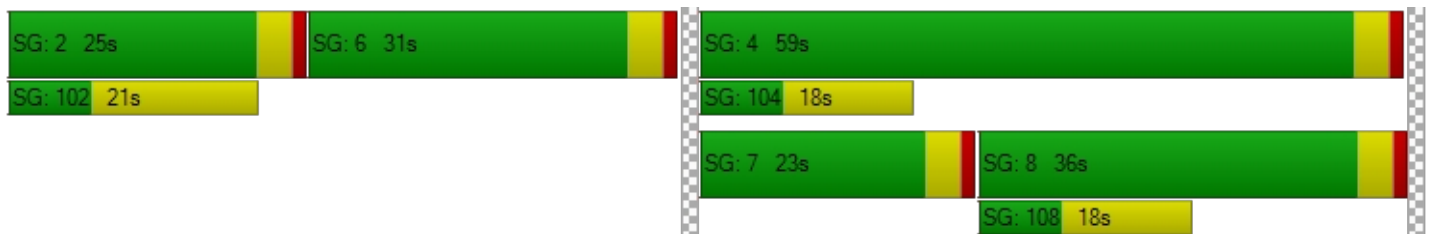
d_M, Delay for Movement [s/veh]	36.96	0.00	82.60	41.72	41.76	36.28	0.00	68.18	68.18	57.28	18.85	0.00
Movement LOS	D		F	D	D	D		E	E	E	B	
d_A, Approach Delay [s/veh]	77.22			41.14				68.18		34.62		
Approach LOS	E			D				E		C		
d_I, Intersection Delay [s/veh]	56.98											
Intersection LOS	E											
Intersection V/C	0.771											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	47.03		47.03		47.03		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.232		2.238		2.627		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]	470		365		557		957
d_b, Bicycle Delay [s]	33.67		38.42		29.95		15.65
I_b,int, Bicycle LOS Score for Intersection	1.560		2.114		2.289		2.052
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):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.356

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	462	323	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	462	323	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	122	85	13
Total Analysis Volume [veh/h]	295	48	56	486	340	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 in	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	0.14	0.11	0.11
s, saturation flow rate [veh/h]	1700	1800	1700	3600	1800	1800
c, Capacity [veh/h]	340	360	1237	2560	1108	1108
d1, Uniform Delay [s]	34.87	29.60	3.88	4.34	7.48	7.48
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, 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	0.35	0.35
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	0.18	0.18
d, Delay for Lane Group [s/veh]	41.60	29.77	3.95	4.51	7.83	7.83
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	1.09	1.44	1.44
50th-Percentile Queue Length [ft/ln]	170.74	21.81	5.88	27.13	35.98	35.98
95th-Percentile Queue Length [veh/ln]	11.12	1.57	0.42	1.95	2.59	2.59
95th-Percentile Queue Length [ft/ln]	277.89	39.25	10.59	48.83	64.76	64.76

Movement, Approach, & Intersection Results

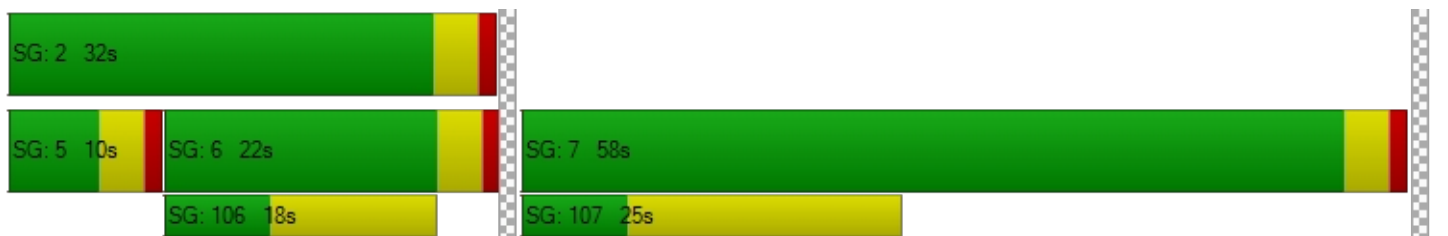
d_M, Delay for Movement [s/veh]	41.60	29.77	3.95	4.51	7.83	7.83
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.95		4.45		7.83	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.02					
Intersection LOS	B					
Intersection V/C	0.356					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.113	2.571	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.007	1.884
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):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.165

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	50	0	185	7	0	8	8	304	47	72	302	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]	50	0	185	7	0	8	8	304	47	72	302	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]	13	0	49	2	0	2	2	80	12	19	79	3
Total Analysis Volume [veh/h]	53	0	195	7	0	8	8	320	49	76	318	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	0.17	0.00	0.24	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]	20.09	21.80	13.21	19.44	18.61	9.57	7.96	0.00	0.00	8.24	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.93	1.93	1.93	0.11	0.11	0.11	0.02	0.00	0.00	0.21	0.00	0.00
95th-Percentile Queue Length [ft/ln]	48.28	48.28	48.28	2.86	2.86	2.86	0.49	0.00	0.00	5.13	0.00	0.00
d_A, Approach Delay [s/veh]	14.68			14.18			0.17			1.54		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.34											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.159

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	328	44	7	321	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	328	44	7	321	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	86	12	2	84	2
Total Analysis Volume [veh/h]	57	0	2	5	0	41	25	345	46	7	338	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 in	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]	69	69	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	0.10	0.10
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1392	1358	130	249	249	105	249	249
d1, Uniform Delay [s]	2.41	2.39	33.84	37.47	37.34	33.48	36.89	36.87
k, delay calibration	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
d2, Incremental Delay [s]	0.06	0.05	0.71	5.73	5.09	0.26	3.46	3.41
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	0.80	0.77	0.07	0.69	0.69
d, Delay for Lane Group [s/veh]	2.46	2.43	34.55	43.20	42.44	33.75	40.34	40.28
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]	0.17	0.13	0.48	4.40	4.23	0.13	3.67	3.65
50th-Percentile Queue Length [ft/ln]	4.13	3.21	12.03	109.90	105.71	3.35	91.81	91.33
95th-Percentile Queue Length [veh/ln]	0.30	0.23	0.87	7.83	7.60	0.24	6.61	6.58
95th-Percentile Queue Length [ft/ln]	7.44	5.77	21.65	195.86	190.02	6.02	165.26	164.39

Movement, Approach, & Intersection Results

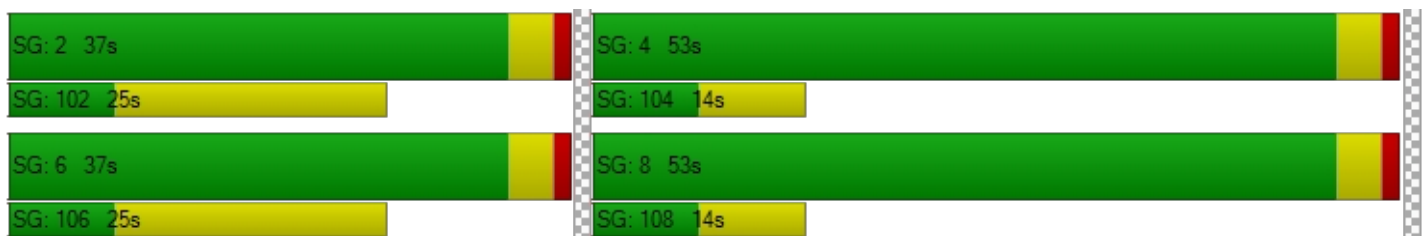
d_M, Delay for Movement [s/veh]	2.46	2.46	2.46	2.43	2.43	2.43	34.55	42.88	42.44	33.75	40.31	40.28
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.46			2.43			42.33			40.18		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.67											
Intersection LOS	D											
Intersection V/C	0.159											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.797			1.801			2.630			2.512		
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]	733			733			1089			1089		
d_b, Bicycle Delay [s]	18.05			18.05			9.34			9.34		
I_b,int, Bicycle LOS Score for Intersection	1.657			1.636			1.903			1.850		
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):	18.0
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	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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	497	420	87	393	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	497	420	87	393	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	131	111	23	103	22	15	17	10	38	10	16
Total Analysis Volume [veh/h]	34	523	442	92	414	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 in	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	0.15	0.25	0.03	0.12	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	7.62	4.40	43.41	6.59	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
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
d2, Incremental Delay [s]	6.15	0.24	0.68	1.98	0.17	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	0.23	0.33	0.49	0.18	0.08	0.69	0.76	0.75	0.32	0.29
d, Delay for Lane Group [s/veh]	51.02	7.86	5.07	45.39	6.76	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	1.89	2.10	1.04	1.27	0.53	1.60	2.76	1.89	1.19	1.08
50th-Percentile Queue Length [ft/ln]	21.56	47.34	52.44	25.98	31.68	13.17	40.09	69.02	47.16	29.73	26.93
95th-Percentile Queue Length [veh/ln]	1.55	3.41	3.78	1.87	2.28	0.95	2.89	4.97	3.40	2.14	1.94
95th-Percentile Queue Length [ft/ln]	38.80	85.22	94.40	46.77	57.02	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	7.86	5.07	45.39	6.76	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]	8.10			12.66			52.08			46.16		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.96											
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 [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]	37.14			37.14			37.14			37.14		
I_p,int, Pedestrian LOS Score for Intersection	2.890			2.913			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]	653			379			758			737		
d_b, Bicycle Delay [s]	21.56			31.21			18.32			18.95		
I_b,int, Bicycle LOS Score for Intersection	2.384			2.050			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):	8.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.228

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	60	1	47	105	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	60	1	47	105	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	16	0	12	28	9	10	4	2	0	1	12
Total Analysis Volume [veh/h]	1	63	1	49	111	35	40	16	6	0	3	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	820	855	775	894
Degree of Utilization, x	0.08	0.23	0.08	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.26	0.88	0.26	0.18
95th-Percentile Queue Length [ft]	6.45	21.93	6.50	4.62
Approach Delay [s/veh]	7.77	8.45	8.05	7.27
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.10			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	55.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.709

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	200	746	124	109	0	389	82	184	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]	42	0	200	746	124	109	0	389	82	184	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]	11	0	53	196	33	29	0	102	22	48	68	0
Total Analysis Volume [veh/h]	44	0	211	785	131	115	0	409	86	194	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 in	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]	22	22	0	0	48	0	0	27	0	23	50	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	
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	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]	35	35	35	35	35	19	19	16	39
g / C, Green / Cycle	0.29	0.29	0.29	0.29	0.29	0.16	0.16	0.13	0.32
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.27	0.27	0.06	0.14	0.14	0.11	0.08
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	489	518	489	489	518	287	287	225	1169
d1, Uniform Delay [s]	31.29	34.52	41.71	41.71	32.56	49.21	49.21	51.07	29.64
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.12	0.12	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]	0.36	2.37	27.61	27.61	0.99	8.38	8.38	9.52	0.10
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	0.09	0.41	0.94	0.94	0.22	0.86	0.86	0.86	0.23
d, Delay for Lane Group [s/veh]	31.65	36.89	69.32	69.32	33.55	57.59	57.59	60.60	29.74
Lane Group LOS	C	D	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]	0.98	5.27	16.69	16.69	2.68	7.69	7.69	6.16	2.83
50th-Percentile Queue Length [ft/ln]	24.54	131.82	417.14	417.14	66.93	192.34	192.34	153.88	70.78
95th-Percentile Queue Length [veh/ln]	1.77	9.04	23.38	23.38	4.82	12.24	12.24	10.22	5.10
95th-Percentile Queue Length [ft/ln]	44.16	225.96	584.62	584.62	120.47	306.06	306.06	255.60	127.40

Movement, Approach, & Intersection Results

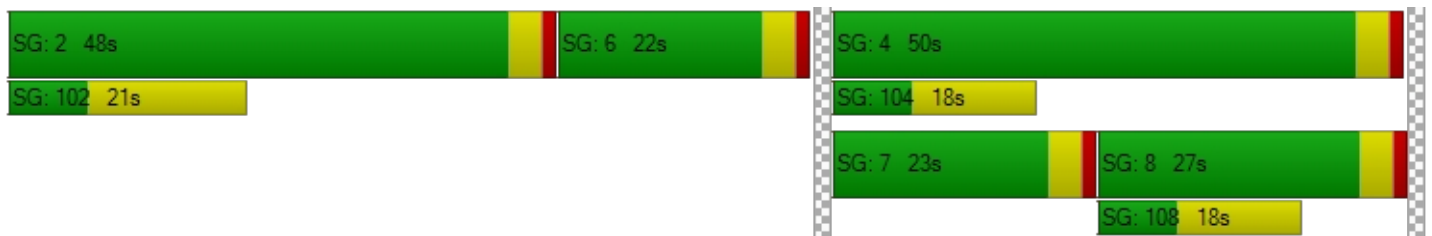
d_M, Delay for Movement [s/veh]	31.65	0.00	36.89	69.32	69.32	33.55	0.00	57.59	57.59	60.60	29.74	0.00
Movement LOS	C		D	E	E	C		E	E	E	C	
d_A, Approach Delay [s/veh]	35.99			65.33				57.59		42.53		
Approach LOS	D			E				E		D		
d_I, Intersection Delay [s/veh]	55.56											
Intersection LOS	E											
Intersection V/C	0.709											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.207		2.438		2.484		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]	300		733		383		767
d_b, Bicycle Delay [s]	43.35		24.07		39.20		22.82
I_b,int, Bicycle LOS Score for Intersection	1.560		3.261		1.968		1.946
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):	0.332

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	548	471	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	548	471	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	144	124	20
Total Analysis Volume [veh/h]	194	42	75	577	496	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 in	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	1309	2778	1205	1205
d1, Uniform Delay [s]	37.63	34.13	2.46	2.80	5.85	5.85
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, 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	0.47	0.47
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	0.21	0.24	0.24
d, Delay for Lane Group [s/veh]	44.43	34.44	2.54	2.97	6.32	6.32
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	0.80	1.76	1.76
50th-Percentile Queue Length [ft/ln]	114.49	20.82	4.96	20.02	44.10	44.10
95th-Percentile Queue Length [veh/ln]	8.09	1.50	0.36	1.44	3.18	3.18
95th-Percentile Queue Length [ft/ln]	202.23	37.48	8.92	36.04	79.38	79.38

Movement, Approach, & Intersection Results

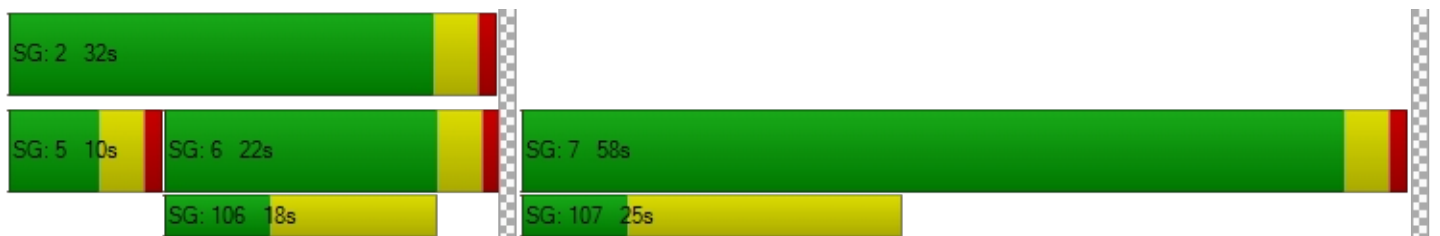
d_M, Delay for Movement [s/veh]	44.43	34.44	2.54	2.97	6.32	6.32
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.66		2.92		6.32	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.66					
Intersection LOS	B					
Intersection V/C	0.332					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.120	2.647	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.098	2.036
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):	43.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	48	2	95	2	0	7	12	522	118	125	364	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]	48	2	95	2	0	7	12	522	118	125	364	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]	13	1	25	1	0	2	3	137	31	33	96	3
Total Analysis Volume [veh/h]	51	2	100	2	0	7	13	549	124	132	383	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	0.35	0.01	0.15	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]	41.37	43.46	22.44	28.04	33.80	9.63	8.14	0.00	0.00	9.60	0.00	0.00
Movement LOS	E	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.74	2.74	2.74	0.07	0.07	0.07	0.03	0.00	0.00	0.50	0.00	0.00
95th-Percentile Queue Length [ft/ln]	68.40	68.40	68.40	1.63	1.63	1.63	0.85	0.00	0.00	12.60	0.00	0.00
d_A, Approach Delay [s/veh]	29.02			13.72			0.15			2.40		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	4.32											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.309

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	576	166	11	429	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	576	166	11	429	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	152	44	3	113	2
Total Analysis Volume [veh/h]	71	6	19	2	8	38	60	606	175	12	452	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 in	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	0.65	0.65	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	0.23	0.21	0.01	0.13	0.13
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1179	1151	298	465	465	119	465	465
d1, Uniform Delay [s]	5.75	5.58	25.60	31.88	31.20	24.87	28.30	28.29
k, delay calibration	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
d2, Incremental Delay [s]	0.14	0.07	0.33	5.21	3.36	0.36	0.81	0.80
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	0.81	0.10	0.49	0.49
d, Delay for Lane Group [s/veh]	5.89	5.65	25.93	37.09	34.56	25.23	29.11	29.09
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]	0.59	0.29	0.96	8.50	7.52	0.19	4.03	4.02
50th-Percentile Queue Length [ft/ln]	14.73	7.16	23.91	212.43	187.97	4.82	100.81	100.41
95th-Percentile Queue Length [veh/ln]	1.06	0.52	1.72	13.28	12.02	0.35	7.26	7.23
95th-Percentile Queue Length [ft/ln]	26.51	12.88	43.04	331.95	300.40	8.67	181.45	180.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.89	5.89	5.89	5.65	5.65	5.65	25.93	36.25	34.56	25.23	29.10	29.09
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.89			5.65			35.16			29.00		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.27											
Intersection LOS	C											
Intersection V/C	0.309											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.921			1.878			2.810			2.623		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.718			1.639			2.253			1.947		
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):	59.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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	280	328	51	618	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	280	328	51	618	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	74	86	13	163	3	1	9	20	299	29	41
Total Analysis Volume [veh/h]	38	295	345	54	651	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 in	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	22.16	3.74	55.97	24.35	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
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
d2, Incremental Delay [s]	9.15	0.29	0.42	1.86	0.88	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	0.20	0.25	0.40	0.43	0.02	0.28	0.80	1.15	0.19	0.19
d, Delay for Lane Group [s/veh]	66.12	22.45	4.16	57.83	25.22	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	2.57	1.73	0.80	6.22	0.22	0.10	3.84	25.06	2.55	2.55
50th-Percentile Queue Length [ft/ln]	31.51	64.20	43.23	20.05	155.47	5.59	2.49	95.93	626.50	63.82	63.82
95th-Percentile Queue Length [veh/ln]	2.27	4.62	3.11	1.44	10.31	0.40	0.18	6.91	36.32	4.60	4.60
95th-Percentile Queue Length [ft/ln]	56.72	115.57	77.81	36.08	257.71	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	22.45	4.16	57.83	25.22	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]	15.59			27.57			63.98			95.26		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	59.70											
Intersection LOS	E											
Intersection V/C	0.741											

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]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersection	3.172			2.909			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			1017		
d_b, Bicycle Delay [s]	33.00			42.50			35.27			14.50		
I_b,int, Bicycle LOS Score for Intersection	2.119			2.153			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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX E-III

**YEAR 2024 WITH PROJECT WITH MITIGATION
TRAFFIC CONDITIONS**

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

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

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	1	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]	48	0	363	258	27	34	0	809	30	233	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]	48	0	363	258	27	34	0	809	30	233	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]	13	0	96	68	7	9	0	213	8	61	88	0
Total Analysis Volume [veh/h]	51	0	382	272	28	36	0	852	32	245	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 in	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]	12.00

Phasing & Timing

Control Type	Split	Permiss	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	11	11	0	29	0	0	30	0	20	50	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	L	C
C, Cycle Length [s]	90	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	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	19	58	19	19	19	24	24	40	40
g / C, Green / Cycle	0.21	0.64	0.21	0.21	0.21	0.27	0.27	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.03	0.21	0.08	0.10	0.02	0.24	0.02	0.14	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	3600	1800	1700	3600
c, Capacity [veh/h]	354	1157	395	427	375	967	483	500	1622
d1, Uniform Delay [s]	29.12	7.30	30.65	31.31	28.82	31.58	24.54	15.90	15.08
k, delay calibration	0.50	0.50	0.50	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]	0.85	0.77	2.30	2.67	0.51	2.84	0.06	0.75	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	0.14	0.33	0.34	0.39	0.10	0.88	0.07	0.49	0.22
d, Delay for Lane Group [s/veh]	29.97	8.06	32.95	33.98	29.33	34.42	24.60	16.64	15.15
Lane Group LOS	C	A	C	C	C	C	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.96	3.07	2.67	3.40	0.67	8.61	0.49	3.02	2.01
50th-Percentile Queue Length [ft/ln]	24.03	76.69	66.73	84.91	16.65	215.18	12.20	75.62	50.14
95th-Percentile Queue Length [veh/ln]	1.73	5.52	4.80	6.11	1.20	13.42	0.88	5.44	3.61
95th-Percentile Queue Length [ft/ln]	43.25	138.04	120.12	152.84	29.97	335.47	21.95	136.12	90.26

Movement, Approach, & Intersection Results

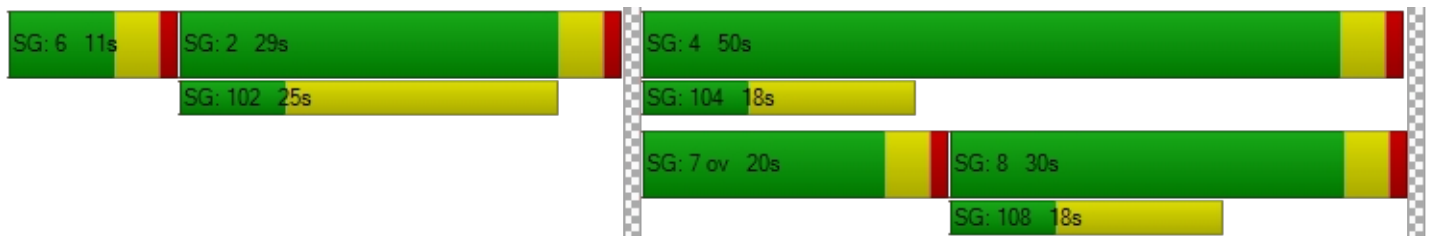
d_M, Delay for Movement [s/veh]	29.97	0.00	8.06	33.47	33.98	29.33	0.00	34.42	24.60	16.64	15.15	0.00
Movement LOS	C		A	C	C	C		C	C	B	B	
d_A, Approach Delay [s/veh]	10.64			33.07			34.06			15.76		
Approach LOS	B			C			C			B		
d_I, Intersection Delay [s/veh]	24.55											
Intersection LOS	C											
Intersection V/C	0.710											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	34.67	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.321	2.226	2.686	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]	156	556	578	1022
d_b, Bicycle Delay [s]	38.27	23.47	22.76	10.76
I_b,int, Bicycle LOS Score for Intersection	1.560	2.114	2.289	2.052
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 4: Twin Knolls Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.285

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	50	0	185	7	0	8	8	304	47	72	302	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
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	0	185	7	0	8	8	304	47	72	302	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]	13	0	49	2	0	2	2	80	12	19	79	3
Total Analysis Volume [veh/h]	53	0	195	7	0	8	8	320	49	76	318	12
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 in	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	8	0	0	4	0	0	2	0	0	6	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	57	0	0	57	0	0	33	0	0	33	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]	16	16	66	66	66	66	66	66
g / C, Green / Cycle	0.18	0.18	0.73	0.73	0.73	0.73	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.16	0.01	0.01	0.10	0.10	0.08	0.09	0.09
s, saturation flow rate [veh/h]	1569	1167	1050	1870	1785	1013	1870	1846
c, Capacity [veh/h]	332	270	780	1365	1303	751	1365	1348
d1, Uniform Delay [s]	35.65	30.37	5.03	3.63	3.63	5.53	3.58	3.58
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.36	0.09	0.02	0.21	0.22	0.27	0.18	0.19
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	0.75	0.06	0.01	0.14	0.14	0.10	0.12	0.12
d, Delay for Lane Group [s/veh]	39.01	30.45	5.05	3.84	3.86	5.80	3.76	3.77
Lane Group LOS	D	C	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	5.47	0.27	0.04	0.74	0.72	0.46	0.65	0.64
50th-Percentile Queue Length [ft/ln]	136.84	6.80	1.09	18.51	18.10	11.42	16.16	16.06
95th-Percentile Queue Length [veh/ln]	9.31	0.49	0.08	1.33	1.30	0.82	1.16	1.16
95th-Percentile Queue Length [ft/ln]	232.76	12.24	1.96	33.31	32.58	20.55	29.10	28.90

Movement, Approach, & Intersection Results

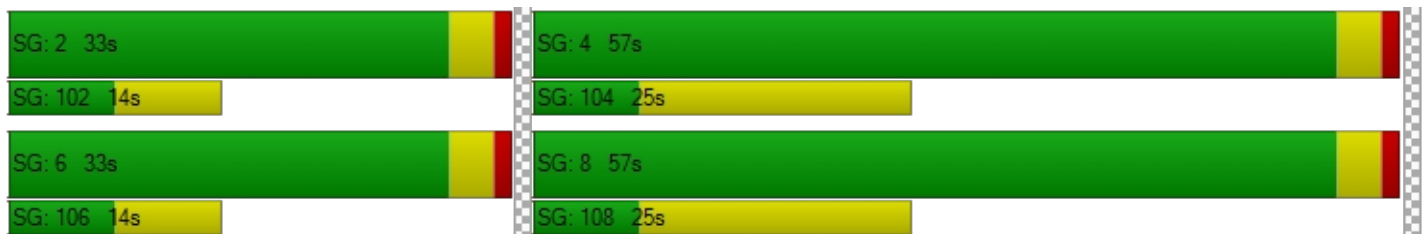
d_M, Delay for Movement [s/veh]	39.01	39.01	39.01	30.45	30.45	30.45	5.05	3.84	3.86	5.80	3.76	3.77
Movement LOS	D	D	D	C	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.01			30.45			3.87			4.15		
Approach LOS	D			C			A			A		
d_I, Intersection Delay [s/veh]	12.69											
Intersection LOS	B											
Intersection V/C	0.285											

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]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.004	1.743	2.596	2.581
Crosswalk LOS	B	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]	1178	1178	644	644
d_b, Bicycle Delay [s]	7.61	7.61	20.67	20.67
I_b,int, Bicycle LOS Score for Intersection	1.969	1.584	1.871	1.895
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 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	45.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

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	1	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	200	746	124	109	0	389	82	184	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]	42	0	200	746	124	109	0	389	82	184	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]	11	0	53	196	33	29	0	102	22	48	68	0
Total Analysis Volume [veh/h]	44	0	211	785	131	115	0	409	86	194	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 in	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	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	10	10	0	29	0	0	22	0	59	81	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	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	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	37	75	37	37	37	16	16	34	34
g / C, Green / Cycle	0.31	0.63	0.31	0.31	0.31	0.14	0.14	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.27	0.27	0.06	0.11	0.05	0.11	0.08
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	3600	1800	1700	3600
c, Capacity [veh/h]	522	1128	522	522	552	491	245	391	1030
d1, Uniform Delay [s]	29.62	9.49	39.49	39.49	30.82	50.54	47.05	34.54	33.12
k, delay calibration	0.50	0.50	0.50	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]	0.32	0.37	18.53	18.53	0.85	3.77	0.85	0.98	0.14
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	0.19	0.88	0.88	0.21	0.83	0.35	0.50	0.27
d, Delay for Lane Group [s/veh]	29.93	9.86	58.01	58.01	31.67	54.30	47.90	35.52	33.26
Lane Group LOS	C	A	E	E	C	D	D	D	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.95	2.35	15.22	15.22	2.59	6.08	2.34	4.54	3.02
50th-Percentile Queue Length [ft/ln]	23.73	58.78	380.50	380.50	64.69	152.06	58.47	113.56	75.59
95th-Percentile Queue Length [veh/ln]	1.71	4.23	21.62	21.62	4.66	10.13	4.21	8.04	5.44
95th-Percentile Queue Length [ft/ln]	42.71	105.81	540.45	540.45	116.44	253.18	105.24	200.94	136.06

Movement, Approach, & Intersection Results

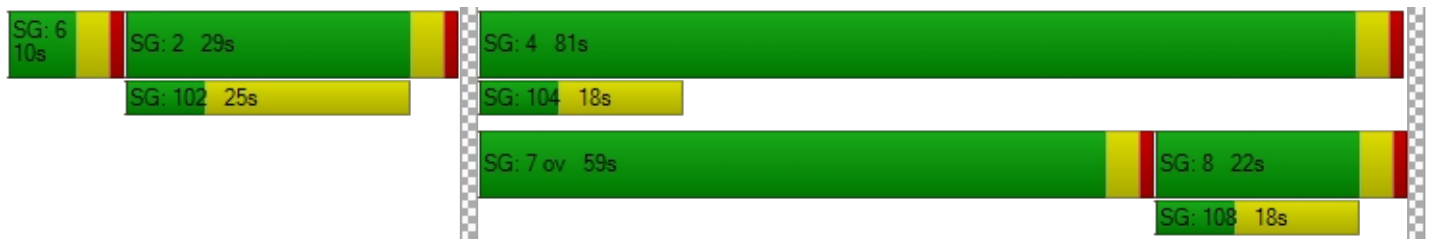
d_M, Delay for Movement [s/veh]	29.93	0.00	9.86	58.01	58.01	31.67	0.00	54.30	47.90	35.52	33.26	0.00
Movement LOS	C		A	E	E	C		D	D	D	C	
d_A, Approach Delay [s/veh]	13.32			55.08			53.19			34.20		
Approach LOS	B			E			D			C		
d_I, Intersection Delay [s/veh]	45.58											
Intersection LOS	D											
Intersection V/C	0.575											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.249	2.438	2.585	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	417	300	1283
d_b, Bicycle Delay [s]	54.15	37.60	43.35	7.70
I_b,int, Bicycle LOS Score for Intersection	1.560	3.261	1.968	1.946
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 4: Twin Knolls Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	7.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.312

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	48	2	95	2	0	7	12	522	118	125	364	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
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	2	95	2	0	7	12	522	118	125	364	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]	13	1	25	1	0	2	3	137	31	33	96	3
Total Analysis Volume [veh/h]	51	2	100	2	0	7	13	549	124	132	383	13
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 in	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	8	0	0	4	0	0	2	0	0	6	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	72	0	0	72	0	0	18	0	0	18	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]	11	11	71	71	71	71	71	71
g / C, Green / Cycle	0.12	0.12	0.79	0.79	0.79	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.10	0.01	0.01	0.19	0.19	0.17	0.11	0.11
s, saturation flow rate [veh/h]	1564	1691	988	1870	1753	765	1870	1848
c, Capacity [veh/h]	239	250	804	1481	1388	622	1481	1464
d1, Uniform Delay [s]	38.54	35.06	3.27	2.38	2.39	4.61	2.17	2.17
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.83	0.06	0.04	0.37	0.40	0.78	0.19	0.19
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	0.64	0.04	0.02	0.23	0.24	0.21	0.13	0.13
d, Delay for Lane Group [s/veh]	41.37	35.12	3.30	2.76	2.79	5.39	2.36	2.37
Lane Group LOS	D	D	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.43	0.18	0.05	0.84	0.80	0.72	0.44	0.44
50th-Percentile Queue Length [ft/ln]	85.71	4.43	1.23	21.05	20.10	18.12	10.96	10.88
95th-Percentile Queue Length [veh/ln]	6.17	0.32	0.09	1.52	1.45	1.30	0.79	0.78
95th-Percentile Queue Length [ft/ln]	154.28	7.97	2.22	37.88	36.18	32.62	19.72	19.59

Movement, Approach, & Intersection Results

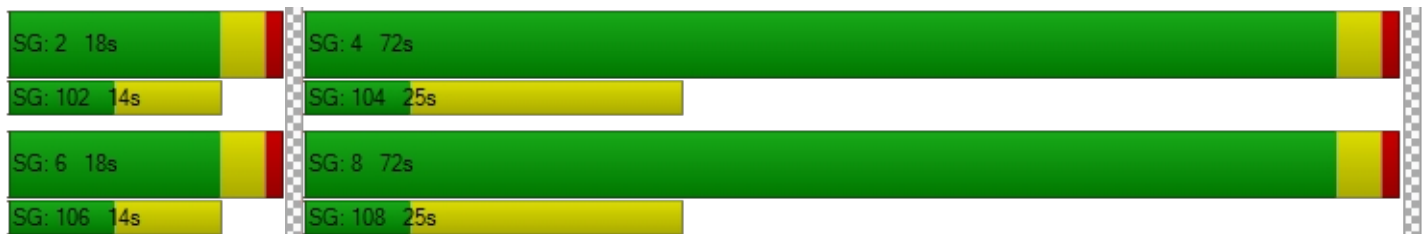
d_M, Delay for Movement [s/veh]	41.37	41.37	41.37	35.12	35.12	35.12	3.30	2.77	2.79	5.39	2.36	2.37
Movement LOS	D	D	D	D	D	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	41.37			35.12			2.78			3.12		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	7.41											
Intersection LOS	A											
Intersection V/C	0.312											

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]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.102	1.751	2.702	2.647
Crosswalk LOS	B	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]	1511	1511	311	311
d_b, Bicycle Delay [s]	2.69	2.69	32.09	32.09
I_b,int, Bicycle LOS Score for Intersection	1.812	1.574	2.126	1.995
Bicycle LOS	A	A	B	A

Sequence

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



APPENDIX F

**YEAR 2040 TRAFFIC CONDITIONS INTERSECTION
LEVEL OF SERVICE CALCULATION WORKSHEETS**

APPENDIX F-1

**YEAR 2040 WITHOUT PROJECT
TRAFFIC CONDITIONS**

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):	0.142

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	17	0	30	15	74	74	12	0	0	6	86
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	17	0	30	15	74	74	12	0	0	6	86
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	4	0	8	4	19	19	3	0	0	2	23
Total Analysis Volume [veh/h]	2	18	0	32	16	78	78	13	0	0	6	91
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	801	890	797	949
Degree of Utilization, x	0.02	0.14	0.11	0.10

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	0.49	0.39	0.34
95th-Percentile Queue Length [ft]	1.92	12.31	9.63	8.51
Approach Delay [s/veh]	7.61	7.71	8.10	7.22
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.67			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	53.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

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]	41	0	363	300	19	36	0	913	29	245	446	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]	41	0	363	300	19	36	0	913	29	245	446	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	96	79	5	9	0	240	8	64	117	0
Total Analysis Volume [veh/h]	43	0	382	316	20	38	0	961	31	258	469	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 in	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
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]	28	28	0	0	25	0	0	36	0	21	57	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]	110	110	110	110	110	110	110	110	110
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]	23	23	23	23	23	30	30	18	52
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	0.02	0.20	0.09	0.09	0.02	0.26	0.26	0.14	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1900	1900	1800	3800
c, Capacity [veh/h]	377	398	377	377	398	517	517	295	1794
d1, Uniform Delay [s]	35.28	43.10	37.97	37.99	35.14	39.50	39.50	44.99	17.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.42	0.42	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]	0.61	36.08	3.76	3.80	0.48	27.51	27.51	8.12	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
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	0.11	0.96	0.44	0.45	0.10	0.96	0.96	0.88	0.26
d, Delay for Lane Group [s/veh]	35.89	79.18	41.73	41.79	35.62	67.01	67.01	53.11	17.59
Lane Group LOS	D	E	D	D	D	E	E	D	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.99	14.06	4.29	4.31	0.87	16.49	16.49	7.30	3.39
50th-Percentile Queue Length [ft/ln]	24.80	351.49	107.14	107.81	21.74	412.37	412.37	182.49	84.65
95th-Percentile Queue Length [veh/ln]	1.79	20.21	7.68	7.72	1.57	23.16	23.16	11.73	6.10
95th-Percentile Queue Length [ft/ln]	44.65	505.22	192.01	192.95	39.13	578.89	578.89	293.26	152.38

Movement, Approach, & Intersection Results

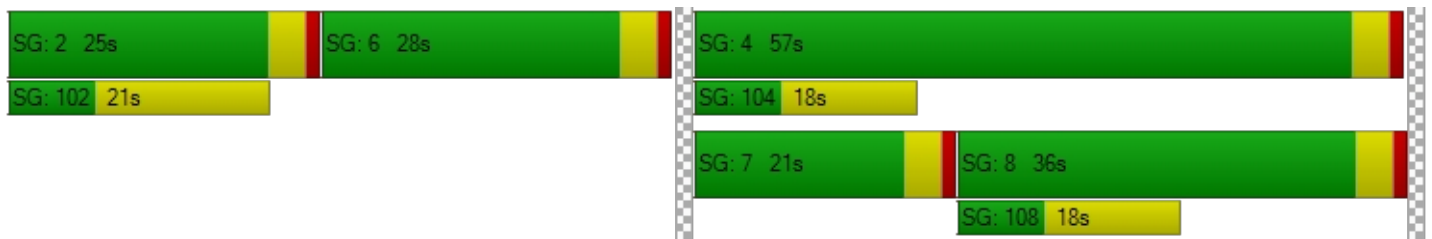
d_M, Delay for Movement [s/veh]	35.89	0.00	79.18	41.76	41.79	35.62	0.00	67.01	67.01	53.11	17.59	0.00
Movement LOS	D		E	D	D	D		E	E	D	B	
d_A, Approach Delay [s/veh]	74.80			41.14			67.01			30.19		
Approach LOS	E			D			E			C		
d_I, Intersection Delay [s/veh]	53.85											
Intersection LOS	D											
Intersection V/C	0.785											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	44.55	44.55	44.55	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.228	2.247	2.704	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]	436	382	582	964
d_b, Bicycle Delay [s]	33.62	36.00	27.65	14.77
I_b,int, Bicycle LOS Score for Intersection	1.560	2.177	2.378	2.159
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):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.346

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]	294	48	56	464	353	53
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]	294	48	56	464	353	53
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]	77	13	15	122	93	14
Total Analysis Volume [veh/h]	309	51	59	488	372	56
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 in	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]	1800	1900	1800	3800	1900	1900
c, Capacity [veh/h]	358	377	1304	2708	1170	1170
d1, Uniform Delay [s]	34.91	29.71	3.85	4.27	7.50	7.50
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.28	0.16	0.07	0.15	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	0.86	0.14	0.05	0.18	0.18	0.18
d, Delay for Lane Group [s/veh]	41.18	29.87	3.91	4.42	7.84	7.84
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.11	0.93	0.24	1.07	1.57	1.57
50th-Percentile Queue Length [ft/ln]	177.72	23.20	6.11	26.71	39.16	39.16
95th-Percentile Queue Length [veh/ln]	11.48	1.67	0.44	1.92	2.82	2.82
95th-Percentile Queue Length [ft/ln]	287.04	41.76	11.00	48.08	70.49	70.49

Movement, Approach, & Intersection Results

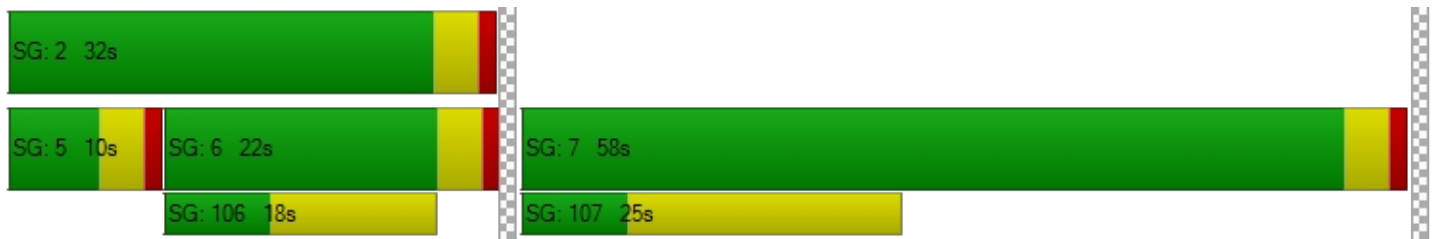
d_M, Delay for Movement [s/veh]	41.18	29.87	3.91	4.42	7.84	7.84
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.58		4.36		7.84	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	14.98					
Intersection LOS	B					
Intersection V/C	0.346					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.122	2.583	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.011	1.913
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):	20.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.030

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	43	0	185	7	0	8	8	322	44	76	333	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]	43	0	185	7	0	8	8	322	44	76	333	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]	11	0	49	2	0	2	2	85	12	20	88	3
Total Analysis Volume [veh/h]	45	0	195	7	0	8	8	339	46	80	351	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	0.15	0.00	0.24	0.03	0.00	0.01	0.01	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	20.78	22.78	13.10	20.86	19.81	9.73	8.04	0.00	0.00	8.30	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.85	1.85	1.85	0.12	0.12	0.12	0.02	0.00	0.00	0.22	0.00	0.00
95th-Percentile Queue Length [ft/ln]	46.13	46.13	46.13	3.09	3.09	3.09	0.51	0.00	0.00	5.50	0.00	0.00
d_A, Approach Delay [s/veh]	14.54			14.92			0.16			1.50		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.07											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.155

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	57	0	2	5	0	41	25	335	46	7	339	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]	57	0	2	5	0	41	25	335	46	7	339	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]	15	0	1	1	0	11	7	88	12	2	89	2
Total Analysis Volume [veh/h]	60	0	2	5	0	43	26	353	48	7	357	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 in	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	38	0	0	38	0	0	52	0	0	52	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	0.78	0.78	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	0.10	0.00	0.10	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800	1900	1900
c, Capacity [veh/h]	1474	1440	128	258	258	107	258	258
d1, Uniform Delay [s]	2.35	2.33	34.05	37.58	37.45	33.69	37.12	37.10
k, delay calibration	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
d2, Incremental Delay [s]	0.05	0.04	0.77	5.35	4.74	0.25	3.56	3.51
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	0.20	0.79	0.77	0.07	0.71	0.70
d, Delay for Lane Group [s/veh]	2.40	2.37	34.82	42.93	42.19	33.94	40.67	40.61
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]	0.17	0.13	0.50	4.49	4.31	0.13	3.89	3.87
50th-Percentile Queue Length [ft/ln]	4.20	3.23	12.57	112.20	107.86	3.35	97.26	96.76
95th-Percentile Queue Length [veh/ln]	0.30	0.23	0.91	7.96	7.72	0.24	7.00	6.97
95th-Percentile Queue Length [ft/ln]	7.56	5.82	22.63	199.06	193.02	6.04	175.08	174.16

Movement, Approach, & Intersection Results

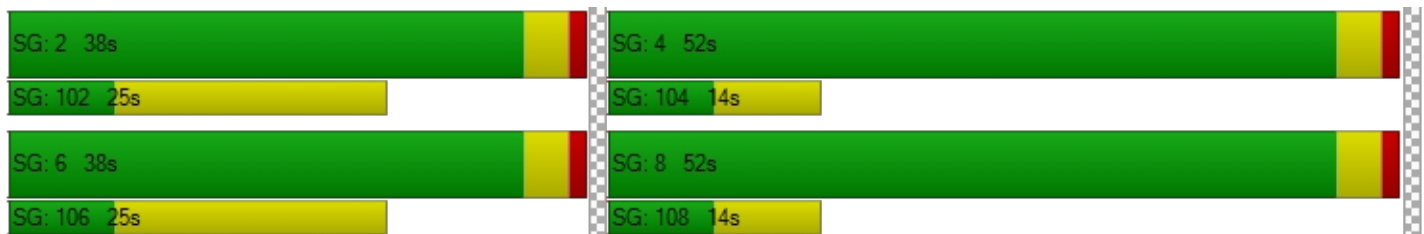
d_M, Delay for Movement [s/veh]	2.40	2.40	2.40	2.37	2.37	2.37	34.82	42.62	42.19	33.94	40.64	40.61
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.40			2.37			42.09			40.52		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.64											
Intersection LOS	D											
Intersection V/C	0.155											

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]	34.67			34.67			34.67			34.67		
l_p,int, Pedestrian LOS Score for Intersection	1.800			1.804			2.644			2.520		
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]	756			756			1067			1067		
d_b, Bicycle Delay [s]	17.42			17.42			9.80			9.80		
l_b,int, Bicycle LOS Score for Intersection	1.662			1.639			1.912			1.866		
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):	22.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	34	600	441	115	392	95	102	69	40	153	40	222
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]	34	600	441	115	392	95	102	69	40	153	40	222
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	158	116	30	103	25	27	18	11	40	11	58
Total Analysis Volume [veh/h]	36	632	464	121	413	100	107	73	42	161	42	234
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 in	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]	105
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	21	32	0	28	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]	105	105	105	105	105	105	105	105	105	105	105
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	63	79	6	65	65	8	8	12	12	12
g / C, Green / Cycle	0.04	0.60	0.75	0.06	0.62	0.62	0.08	0.08	0.11	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.02	0.17	0.24	0.04	0.11	0.05	0.06	0.06	0.05	0.07	0.07
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	1800	1900	3400	1900	1900
c, Capacity [veh/h]	67	2277	1429	189	2346	1173	136	148	390	223	223
d1, Uniform Delay [s]	49.65	10.12	4.28	48.56	8.62	8.11	47.74	47.50	43.21	44.19	44.03
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
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
d2, Incremental Delay [s]	6.43	0.30	0.60	3.56	0.16	0.14	9.71	8.32	0.70	2.95	2.63
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	0.53	0.28	0.32	0.64	0.18	0.09	0.79	0.77	0.41	0.63	0.60
d, Delay for Lane Group [s/veh]	56.08	10.42	4.88	52.12	8.79	8.25	57.45	55.83	43.91	47.14	46.66
Lane Group LOS	E	B	A	D	A	A	E	E	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.01	3.08	2.35	1.57	1.70	0.80	3.06	3.23	1.94	3.60	3.42
50th-Percentile Queue Length [ft/ln]	25.31	77.02	58.77	39.24	42.53	19.93	76.38	80.67	48.50	90.04	85.47
95th-Percentile Queue Length [veh/ln]	1.82	5.55	4.23	2.83	3.06	1.44	5.50	5.81	3.49	6.48	6.15
95th-Percentile Queue Length [ft/ln]	45.56	138.63	105.78	70.63	76.56	35.88	137.48	145.20	87.29	162.07	153.85

Movement, Approach, & Intersection Results

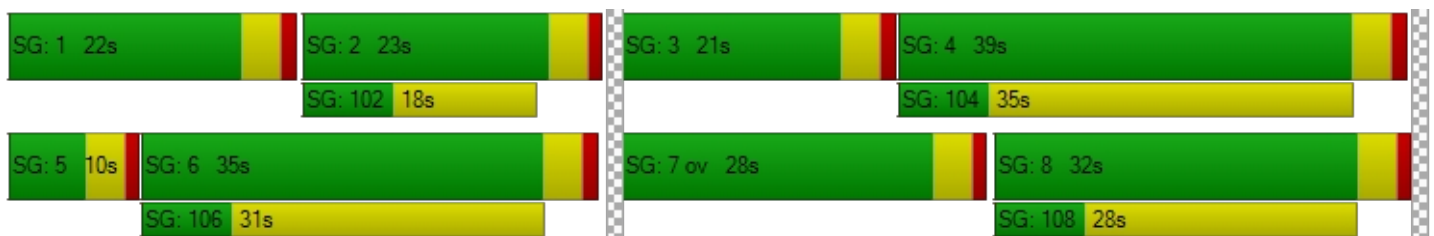
d_M, Delay for Movement [s/veh]	56.08	10.42	4.88	52.12	8.79	8.25	57.45	55.83	55.83	43.91	47.14	46.86
Movement LOS	E	B	A	D	A	A	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	9.60			16.97			56.61			45.80		
Approach LOS	A			B			E			D		
d_I, Intersection Delay [s/veh]	22.36											
Intersection LOS	C											
Intersection V/C	0.450											

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]	42.08			42.08			42.08			42.08		
I_p,int, Pedestrian LOS Score for Intersection	2.934			3.012			2.121			2.697		
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]	590			362			533			667		
d_b, Bicycle Delay [s]	26.08			35.22			28.23			23.33		
I_b,int, Bicycle LOS Score for Intersection	2.494			2.083			1.926			2.281		
Bicycle LOS	B			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 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.128

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	15	1	49	22	35	40	16	6	0	3	49
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	15	1	49	22	35	40	16	6	0	3	49
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	4	0	13	6	9	11	4	2	0	1	13
Total Analysis Volume [veh/h]	1	16	1	52	23	37	42	17	6	0	3	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	842	878	829	969
Degree of Utilization, x	0.02	0.13	0.08	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.07	0.44	0.25	0.18
95th-Percentile Queue Length [ft]	1.64	10.92	6.36	4.51
Approach Delay [s/veh]	7.37	7.70	7.71	6.94
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	7.51			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	110.6
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

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	175	1110	99	114	0	453	81	212	273	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	175	1110	99	114	0	453	81	212	273	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	46	292	26	30	0	119	21	56	72	0
Total Analysis Volume [veh/h]	40	0	184	1168	104	120	0	477	85	223	287	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 in	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	26	0	59	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]	33	33	33	33	33	20	20	17	41
g / C, Green / Cycle	0.28	0.28	0.28	0.28	0.28	0.17	0.17	0.14	0.34
(v / s)_i Volume / Saturation Flow Rate	0.02	0.10	0.35	0.35	0.06	0.15	0.15	0.12	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1900	1900	1800	3800
c, Capacity [veh/h]	499	527	499	499	527	323	323	256	1313
d1, Uniform Delay [s]	32.08	34.74	43.41	43.41	33.49	48.53	48.53	50.47	27.83
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.15	0.15	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]	0.31	1.82	138.36	138.36	1.00	9.58	9.58	9.01	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
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	0.35	1.27	1.27	0.23	0.87	0.87	0.87	0.22
d, Delay for Lane Group [s/veh]	32.40	36.56	181.76	181.76	34.49	58.11	58.11	59.48	27.91
Lane Group LOS	C	D	F	F	C	E	E	E	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.90	4.54	33.67	33.67	2.83	8.82	8.82	7.02	2.85
50th-Percentile Queue Length [ft/ln]	22.55	113.53	841.83	841.83	70.87	220.38	220.38	175.46	71.33
95th-Percentile Queue Length [veh/ln]	1.62	8.04	49.48	49.48	5.10	13.68	13.68	11.36	5.14
95th-Percentile Queue Length [ft/ln]	40.59	200.91	1237.05	1237.05	127.56	342.11	342.11	284.08	128.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.40	0.00	36.56	181.76	181.76	34.49	0.00	58.11	58.11	59.48	27.91	0.00
Movement LOS	C		D	F	F	C		E	E	E	C	
d_A, Approach Delay [s/veh]	35.81			169.07				58.11		41.71		
Approach LOS	D			F				E		D		
d_I, Intersection Delay [s/veh]	110.60											
Intersection LOS	F											
Intersection V/C	0.802											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
l_p,int, Pedestrian LOS Score for Intersection	2.195		2.541		2.514		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		367		1350
d_b, Bicycle Delay [s]	54.15		40.84		40.02		6.34
l_b,int, Bicycle LOS Score for Intersection	1.560		3.856		2.023		1.980
Bicycle LOS	A		D		B		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):	0.327

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]	193	42	71	555	488	81
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]	193	42	71	555	488	81
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]	51	11	19	146	128	21
Total Analysis Volume [veh/h]	203	44	75	584	514	85
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 in	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]	12	12	70	70	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	0.15	0.16	0.16
s, saturation flow rate [veh/h]	1800	1900	1800	3800	1900	1900
c, Capacity [veh/h]	249	263	1386	2936	1274	1274
d1, Uniform Delay [s]	37.66	34.20	2.43	2.75	5.80	5.80
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.34	0.30	0.07	0.15	0.43	0.43
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	0.81	0.17	0.05	0.20	0.24	0.24
d, Delay for Lane Group [s/veh]	43.99	34.50	2.50	2.90	6.23	6.23
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.76	0.87	0.19	0.79	1.81	1.81
50th-Percentile Queue Length [ft/ln]	119.02	21.81	4.86	19.81	45.20	45.20
95th-Percentile Queue Length [veh/ln]	8.34	1.57	0.35	1.43	3.25	3.25
95th-Percentile Queue Length [ft/ln]	208.48	39.26	8.74	35.66	81.36	81.36

Movement, Approach, & Intersection Results

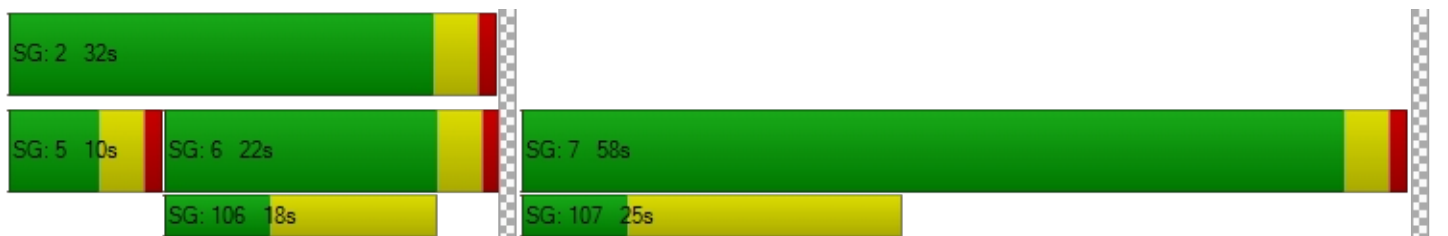
d_M, Delay for Movement [s/veh]	43.99	34.50	2.50	2.90	6.23	6.23
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.30		2.86		6.23	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.67					
Intersection LOS	B					
Intersection V/C	0.327					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.124	2.655	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.103	2.054
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):	44.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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	93	2	0	7	13	534	108	131	376	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	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	93	2	0	7	13	534	108	131	376	13
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	141	28	34	99	3
Total Analysis Volume [veh/h]	46	2	98	2	0	7	14	562	114	138	396	14
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	0.33	0.02	0.15	0.01	0.00	0.01	0.01	0.01	0.00	0.15	0.00	0.00
d_M, Delay for Movement [s/veh]	42.09	44.42	21.79	29.51	35.33	9.69	8.18	0.00	0.00	9.65	0.00	0.00
Movement LOS	E	E	C	D	E	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.57	2.57	2.57	0.07	0.07	0.07	0.04	0.00	0.00	0.53	0.00	0.00
95th-Percentile Queue Length [ft/ln]	64.34	64.34	64.34	1.70	1.70	1.70	0.93	0.00	0.00	13.31	0.00	0.00
d_A, Approach Delay [s/veh]	28.50			14.10			0.17			2.43		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	4.12											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.296

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	70	6	18	2	8	38	60	570	174	12	438	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]	70	6	18	2	8	38	60	570	174	12	438	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	10	16	150	46	3	115	2
Total Analysis Volume [veh/h]	74	6	19	2	8	40	63	600	183	13	461	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 in	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]	60	60	22	22	22	22	22	22
g / C, Green / Cycle	0.66	0.66	0.25	0.25	0.25	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.06	0.03	0.04	0.21	0.20	0.01	0.12	0.12
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800	1900	1900
c, Capacity [veh/h]	1263	1235	298	471	471	122	471	471
d1, Uniform Delay [s]	5.40	5.25	26.31	32.32	31.65	25.58	28.96	28.94
k, delay calibration	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
d2, Incremental Delay [s]	0.12	0.06	0.35	4.86	3.13	0.38	0.81	0.80
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	0.21	0.86	0.80	0.11	0.50	0.49
d, Delay for Lane Group [s/veh]	5.52	5.31	26.66	37.18	34.78	25.96	29.77	29.75
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	1.02	8.52	7.53	0.21	4.16	4.14
50th-Percentile Queue Length [ft/ln]	14.41	7.08	25.53	212.97	188.16	5.30	104.01	103.60
95th-Percentile Queue Length [veh/ln]	1.04	0.51	1.84	13.31	12.03	0.38	7.49	7.46
95th-Percentile Queue Length [ft/ln]	25.93	12.74	45.96	332.64	300.64	9.54	187.22	186.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.52	5.52	5.52	5.31	5.31	5.31	26.66	36.41	34.78	25.96	29.76	29.75
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.52			5.31			35.33			29.65		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.47											
Intersection LOS	C											
Intersection V/C	0.296											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.930			1.885			2.820			2.624		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.723			1.642			2.258			1.956		
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):	56.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.750

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	38	281	344	112	670	17	3	52	80	1192	113	301
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	281	344	112	670	17	3	52	80	1192	113	301
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]	10	74	91	29	176	4	1	14	21	314	30	79
Total Analysis Volume [veh/h]	40	296	362	118	705	18	3	55	84	1255	119	317
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 in	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]	21	35	35	10	24	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	48	91	6	50	50	1	11	39	49	49
g / C, Green / Cycle	0.04	0.40	0.76	0.05	0.41	0.41	0.01	0.09	0.32	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.02	0.08	0.19	0.03	0.19	0.01	0.00	0.07	0.37	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	1800	1900	3400	1900	1900
c, Capacity [veh/h]	68	1525	1442	172	1574	787	10	172	1103	777	777
d1, Uniform Delay [s]	56.85	23.33	4.30	56.06	25.29	20.79	59.44	53.60	40.55	23.68	23.68
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
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
d2, Incremental Delay [s]	7.89	0.28	0.42	4.80	0.92	0.05	14.78	8.75	65.53	0.19	0.19
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	0.59	0.19	0.25	0.69	0.45	0.02	0.29	0.81	1.14	0.28	0.28
d, Delay for Lane Group [s/veh]	64.75	23.61	4.72	60.86	26.21	20.85	74.23	62.35	106.08	23.88	23.88
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]	1.31	2.65	2.05	1.80	6.91	0.29	0.13	4.47	25.70	4.07	4.07
50th-Percentile Queue Length [ft/ln]	32.67	66.33	51.33	45.11	172.72	7.33	3.30	111.67	642.42	101.70	101.70
95th-Percentile Queue Length [veh/ln]	2.35	4.78	3.70	3.25	11.22	0.53	0.24	7.93	36.89	7.32	7.32
95th-Percentile Queue Length [ft/ln]	58.81	119.39	92.40	81.19	280.48	13.20	5.94	198.32	922.35	183.07	183.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	64.75	23.61	4.72	60.86	26.21	20.85	74.23	62.35	62.35	106.08	23.88	23.88
Movement LOS	E	C	A	E	C	C	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	16.17			30.96			62.60			84.89		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	56.27											
Intersection LOS	E											
Intersection V/C	0.750											

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]	49.50			49.50			49.50			49.50		
I_p,int, Pedestrian LOS Score for Intersection	3.209			2.980			2.092			2.949		
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			333			467			1017		
d_b, Bicycle Delay [s]	33.00			41.67			35.27			14.50		
I_b,int, Bicycle LOS Score for Intersection	2.135			2.253			1.794			4.350		
Bicycle LOS	B			B			A			E		

Sequence

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



APPENDIX F-II

YEAR 2040 WITH PROJECT TRAFFIC CONDITIONS

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

Control Type:	All-way stop	Delay (sec / veh):	8.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.179

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	87	0	30	41	74	74	12	0	0	6	86
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	87	0	30	41	74	74	12	0	0	6	86
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	23	0	8	11	19	19	3	0	0	2	23
Total Analysis Volume [veh/h]	2	92	0	32	43	78	78	13	0	0	6	91
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	793	854	755	890
Degree of Utilization, x	0.12	0.18	0.12	0.11

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	0.65	0.41	0.37
95th-Percentile Queue Length [ft]	10.04	16.24	10.24	9.14
Approach Delay [s/veh]	8.15	8.13	8.43	7.54
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.07			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	74.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.831

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]	50	0	425	300	28	36	0	922	31	260	446	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]	50	0	425	300	28	36	0	922	31	260	446	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]	13	0	112	79	7	9	0	243	8	68	117	0
Total Analysis Volume [veh/h]	53	0	447	316	29	38	0	971	33	274	469	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 in	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]	28	28	0	0	25	0	0	32	0	35	67	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	
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	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]	27	27	27	27	27	30	30	20	54
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.22	0.25	0.25	0.17	0.45
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.10	0.10	0.02	0.26	0.26	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1900	1900	1800	3800
c, Capacity [veh/h]	402	424	402	402	424	475	475	306	1722
d1, Uniform Delay [s]	37.32	46.64	40.05	40.08	36.96	45.06	45.06	48.78	20.48
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.16	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]	0.68	58.31	3.30	3.34	0.42	57.23	57.23	12.83	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
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	1.05	0.43	0.43	0.09	1.06	1.06	0.89	0.27
d, Delay for Lane Group [s/veh]	38.00	104.95	43.34	43.42	37.38	102.29	102.29	61.61	20.57
Lane Group LOS	D	F	D	D	D	F	F	E	C
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.32	19.33	4.70	4.74	0.93	21.11	21.11	8.89	3.95
50th-Percentile Queue Length [ft/ln]	33.00	483.29	117.43	118.47	23.32	527.76	527.76	222.20	98.65
95th-Percentile Queue Length [veh/ln]	2.38	27.34	8.25	8.31	1.68	29.63	29.63	13.78	7.10
95th-Percentile Queue Length [ft/ln]	59.40	683.58	206.29	207.73	41.97	740.83	740.83	344.43	177.57

Movement, Approach, & Intersection Results

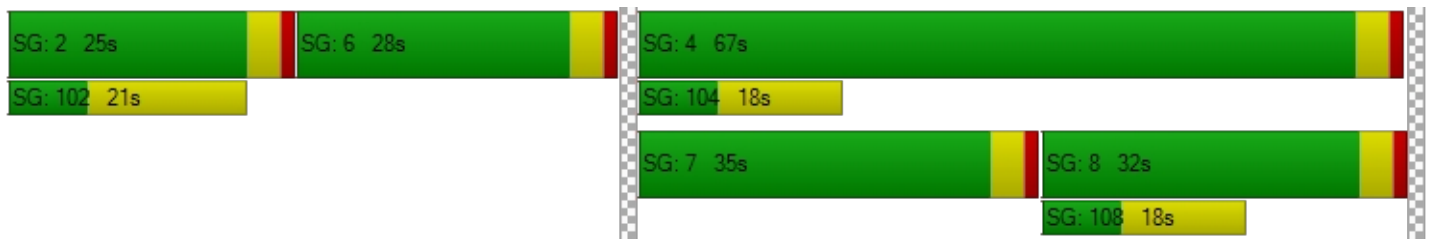
d_M, Delay for Movement [s/veh]	38.00	0.00	104.95	43.38	43.42	37.38	0.00	102.29	102.29	61.61	20.57	0.00
Movement LOS	D		F	D	D	D		F	F	E	C	
d_A, Approach Delay [s/veh]	97.86			42.79			102.29			35.70		
Approach LOS	F			D			F			D		
d_I, Intersection Delay [s/veh]	73.97											
Intersection LOS	E											
Intersection V/C	0.831											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.271	2.254	2.717	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]	400	350	467	1050
d_b, Bicycle Delay [s]	38.40	40.84	35.27	13.54
I_b,int, Bicycle LOS Score for Intersection	1.560	2.192	2.388	2.173
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):	14.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.350

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]	294	48	56	474	362	53
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]	294	48	56	474	362	53
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]	77	13	15	125	95	14
Total Analysis Volume [veh/h]	309	51	59	499	381	56
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 in	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	0.12	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	3800	1900	1900
c, Capacity [veh/h]	358	377	1302	2708	1170	1170
d1, Uniform Delay [s]	34.91	29.71	3.85	4.28	7.52	7.52
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.28	0.16	0.07	0.15	0.35	0.35
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	0.86	0.14	0.05	0.18	0.19	0.19
d, Delay for Lane Group [s/veh]	41.18	29.87	3.91	4.43	7.87	7.87
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.11	0.93	0.24	1.10	1.60	1.60
50th-Percentile Queue Length [ft/ln]	177.72	23.20	6.11	27.41	40.10	40.10
95th-Percentile Queue Length [veh/ln]	11.48	1.67	0.44	1.97	2.89	2.89
95th-Percentile Queue Length [ft/ln]	287.04	41.76	11.00	49.33	72.18	72.18

Movement, Approach, & Intersection Results

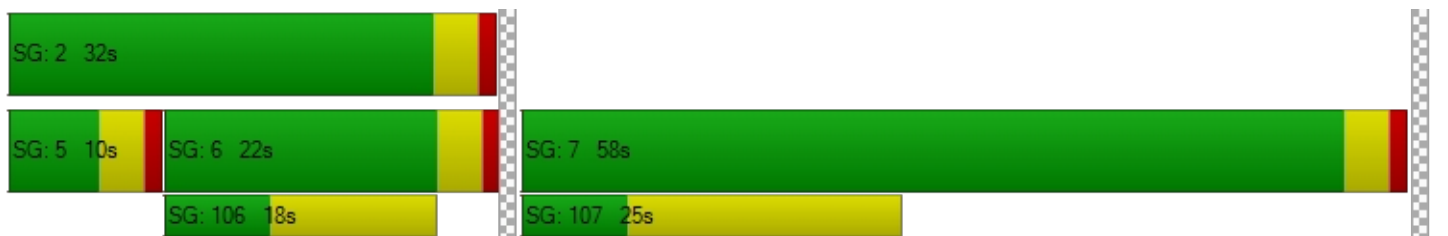
d_M, Delay for Movement [s/veh]	41.18	29.87	3.91	4.43	7.87	7.87
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.58		4.38		7.87	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	14.86					
Intersection LOS	B					
Intersection V/C	0.350					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.122	2.589	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.020	1.920
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):	22.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.188

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	52	0	194	7	0	8	8	324	49	76	342	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]	52	0	194	7	0	8	8	324	49	76	342	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]	14	0	51	2	0	2	2	85	13	20	90	3
Total Analysis Volume [veh/h]	55	0	204	7	0	8	8	341	52	80	360	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	0.19	0.00	0.25	0.03	0.00	0.01	0.01	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	21.98	24.06	14.13	21.41	20.17	9.79	8.07	0.00	0.00	8.33	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.23	2.23	2.23	0.13	0.13	0.13	0.02	0.00	0.00	0.22	0.00	0.00
95th-Percentile Queue Length [ft/ln]	55.71	55.71	55.71	3.18	3.18	3.18	0.51	0.00	0.00	5.54	0.00	0.00
d_A, Approach Delay [s/veh]	15.79			15.21			0.16			1.47		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	4.48											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.157

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	57	0	2	5	0	41	25	341	46	7	357	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]	57	0	2	5	0	41	25	341	46	7	357	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]	15	0	1	1	0	11	7	90	12	2	94	2
Total Analysis Volume [veh/h]	60	0	2	5	0	43	26	359	48	7	376	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 in	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	38	0	0	38	0	0	52	0	0	52	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	0.10	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800	1900	1900
c, Capacity [veh/h]	1471	1437	122	261	261	108	261	261
d1, Uniform Delay [s]	2.38	2.36	33.92	37.50	37.37	33.56	37.18	37.17
k, delay calibration	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
d2, Incremental Delay [s]	0.05	0.04	0.86	5.35	4.74	0.25	4.01	3.95
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	0.21	0.79	0.77	0.07	0.74	0.73
d, Delay for Lane Group [s/veh]	2.44	2.41	34.78	42.85	42.11	33.81	41.19	41.12
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]	0.17	0.13	0.50	4.55	4.38	0.13	4.13	4.11
50th-Percentile Queue Length [ft/ln]	4.27	3.29	12.59	113.80	109.39	3.35	103.22	102.67
95th-Percentile Queue Length [veh/ln]	0.31	0.24	0.91	8.05	7.81	0.24	7.43	7.39
95th-Percentile Queue Length [ft/ln]	7.68	5.91	22.66	201.27	195.16	6.02	185.80	184.81

Movement, Approach, & Intersection Results

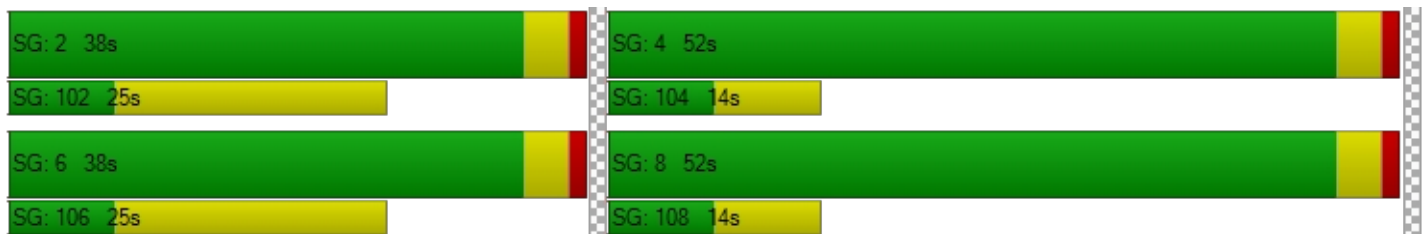
d_M, Delay for Movement [s/veh]	2.44	2.44	2.44	2.41	2.41	2.41	34.78	42.54	42.11	33.81	41.16	41.12
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.44			2.41			42.02			41.03		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.94											
Intersection LOS	D											
Intersection V/C	0.157											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.800			1.804			2.651			2.528		
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]	756			756			1067			1067		
d_b, Bicycle Delay [s]	17.42			17.42			9.80			9.80		
I_b,int, Bicycle LOS Score for Intersection	1.662			1.639			1.917			1.881		
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):	22.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	34	618	441	115	398	95	102	69	40	153	40	222
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]	34	618	441	115	398	95	102	69	40	153	40	222
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	163	116	30	105	25	27	18	11	40	11	58
Total Analysis Volume [veh/h]	36	651	464	121	419	100	107	73	42	161	42	234
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 in	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]	105
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	21	32	0	28	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]	105	105	105	105	105	105	105	105	105	105	105
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	63	79	6	65	65	8	8	12	12	12
g / C, Green / Cycle	0.04	0.60	0.75	0.06	0.62	0.62	0.08	0.08	0.11	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.02	0.17	0.24	0.04	0.11	0.05	0.06	0.06	0.05	0.07	0.07
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	1800	1900	3400	1900	1900
c, Capacity [veh/h]	67	2277	1429	189	2346	1173	136	148	390	223	223
d1, Uniform Delay [s]	49.65	10.18	4.28	48.56	8.64	8.11	47.74	47.50	43.21	44.19	44.03
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
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
d2, Incremental Delay [s]	6.43	0.32	0.60	3.56	0.17	0.14	9.71	8.32	0.70	2.95	2.63
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	0.53	0.29	0.32	0.64	0.18	0.09	0.79	0.77	0.41	0.63	0.60
d, Delay for Lane Group [s/veh]	56.08	10.50	4.88	52.12	8.80	8.25	57.45	55.83	43.91	47.14	46.66
Lane Group LOS	E	B	A	D	A	A	E	E	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.01	3.19	2.35	1.57	1.73	0.80	3.06	3.23	1.94	3.60	3.42
50th-Percentile Queue Length [ft/ln]	25.31	79.82	58.77	39.24	43.23	19.93	76.38	80.67	48.50	90.04	85.47
95th-Percentile Queue Length [veh/ln]	1.82	5.75	4.23	2.83	3.11	1.44	5.50	5.81	3.49	6.48	6.15
95th-Percentile Queue Length [ft/ln]	45.56	143.68	105.78	70.63	77.81	35.88	137.48	145.20	87.29	162.07	153.85

Movement, Approach, & Intersection Results

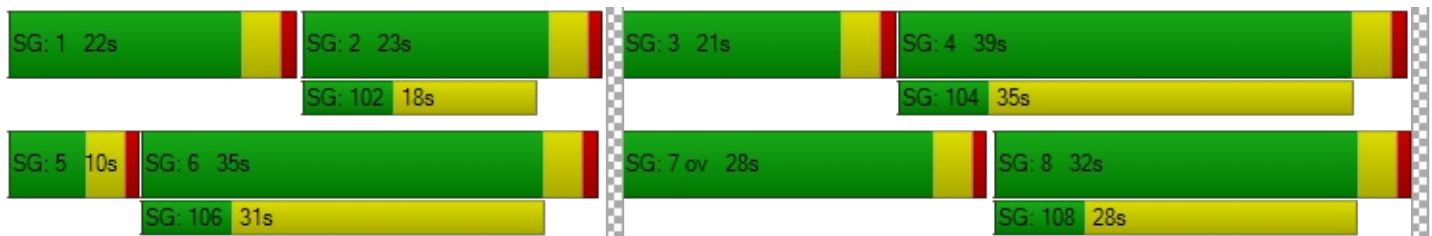
d_M, Delay for Movement [s/veh]	56.08	10.50	4.88	52.12	8.80	8.25	57.45	55.83	55.83	43.91	47.14	46.86
Movement LOS	E	B	A	D	A	A	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	9.66			16.91			56.61			45.80		
Approach LOS	A			B			E			D		
d_I, Intersection Delay [s/veh]	22.25											
Intersection LOS	C											
Intersection V/C	0.450											

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]	42.08			42.08			42.08			42.08		
I_p,int, Pedestrian LOS Score for Intersection	2.940			3.018			2.121			2.697		
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]	590			362			533			667		
d_b, Bicycle Delay [s]	26.08			35.22			28.23			23.33		
I_b,int, Bicycle LOS Score for Intersection	2.509			2.088			1.926			2.281		
Bicycle LOS	B			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 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

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	61	1	49	106	35	40	16	6	0	3	49
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	61	1	49	106	35	40	16	6	0	3	49
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	16	0	13	28	9	11	4	2	0	1	13
Total Analysis Volume [veh/h]	1	64	1	52	112	37	42	17	6	0	3	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	815	852	771	890
Degree of Utilization, x	0.08	0.24	0.08	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.26	0.92	0.28	0.20
95th-Percentile Queue Length [ft]	6.59	22.90	6.88	4.93
Approach Delay [s/veh]	7.81	8.53	8.10	7.31
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.16			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	132.2
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

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]	44	0	216	1110	129	114	0	459	86	262	273	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]	44	0	216	1110	129	114	0	459	86	262	273	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]	12	0	57	292	34	30	0	121	23	69	72	0
Total Analysis Volume [veh/h]	46	0	227	1168	136	120	0	483	91	276	287	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 in	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	25	0	60	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]	31	31	31	31	31	21	21	21	45
g / C, Green / Cycle	0.26	0.26	0.26	0.26	0.26	0.17	0.17	0.17	0.38
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.36	0.36	0.06	0.15	0.15	0.15	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1900	1900	1800	3800
c, Capacity [veh/h]	470	496	470	470	496	330	330	308	1436
d1, Uniform Delay [s]	33.65	37.24	44.38	44.38	35.01	48.34	48.34	48.73	25.14
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.16	0.16	0.17	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]	0.42	3.02	187.12	187.12	1.15	10.09	10.09	13.10	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	0.10	0.46	1.39	1.39	0.24	0.87	0.87	0.90	0.20
d, Delay for Lane Group [s/veh]	34.07	40.27	231.50	231.50	36.16	58.43	58.43	61.82	25.21
Lane Group LOS	C	D	F	F	D	E	E	E	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.07	5.97	38.11	38.11	2.92	9.04	9.04	8.97	2.68
50th-Percentile Queue Length [ft/ln]	26.76	149.14	952.87	952.87	72.90	226.04	226.04	224.31	67.09
95th-Percentile Queue Length [veh/ln]	1.93	9.97	57.16	57.16	5.25	13.97	13.97	13.88	4.83
95th-Percentile Queue Length [ft/ln]	48.16	249.28	1428.94	1428.94	131.22	349.33	349.33	347.12	120.76

Movement, Approach, & Intersection Results

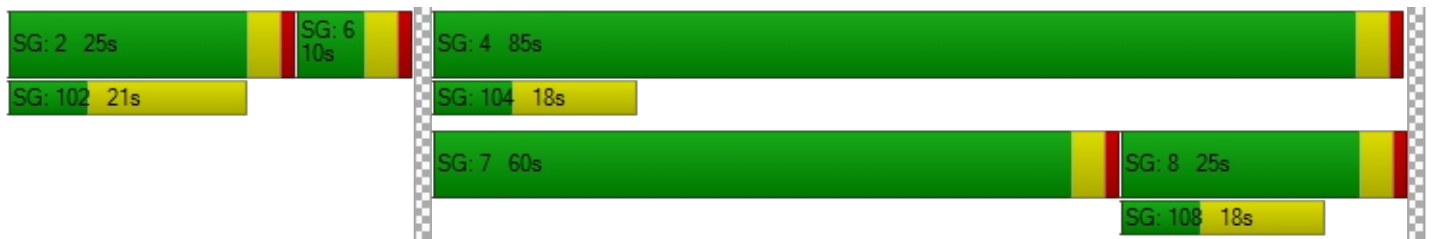
d_M, Delay for Movement [s/veh]	34.07	0.00	40.27	231.50	231.50	36.16	0.00	58.43	58.43	61.82	25.21	0.00
Movement LOS	C		D	F	F	D		E	E	E	C	
d_A, Approach Delay [s/veh]	39.22			215.04				58.43		43.16		
Approach LOS	D			F				E		D		
d_I, Intersection Delay [s/veh]	132.24											
Intersection LOS	F											
Intersection V/C	0.873											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.248		2.550		2.520		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		350		1350
d_b, Bicycle Delay [s]	54.15		40.84		40.84		6.34
I_b,int, Bicycle LOS Score for Intersection	1.560		3.909		2.033		2.024
Bicycle LOS	A		D		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):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.329

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]	193	42	71	566	494	81
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]	193	42	71	566	494	81
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]	51	11	19	149	130	21
Total Analysis Volume [veh/h]	203	44	75	596	520	85
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 in	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]	12	12	70	70	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]	1800	1900	1800	3800	1900	1900
c, Capacity [veh/h]	249	263	1384	2936	1274	1274
d1, Uniform Delay [s]	37.66	34.20	2.43	2.76	5.81	5.81
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.34	0.30	0.07	0.16	0.44	0.44
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	0.81	0.17	0.05	0.20	0.24	0.24
d, Delay for Lane Group [s/veh]	43.99	34.50	2.50	2.92	6.25	6.25
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.76	0.87	0.19	0.81	1.83	1.83
50th-Percentile Queue Length [ft/ln]	119.02	21.81	4.86	20.29	45.74	45.74
95th-Percentile Queue Length [veh/ln]	8.34	1.57	0.35	1.46	3.29	3.29
95th-Percentile Queue Length [ft/ln]	208.48	39.26	8.74	36.53	82.34	82.34

Movement, Approach, & Intersection Results

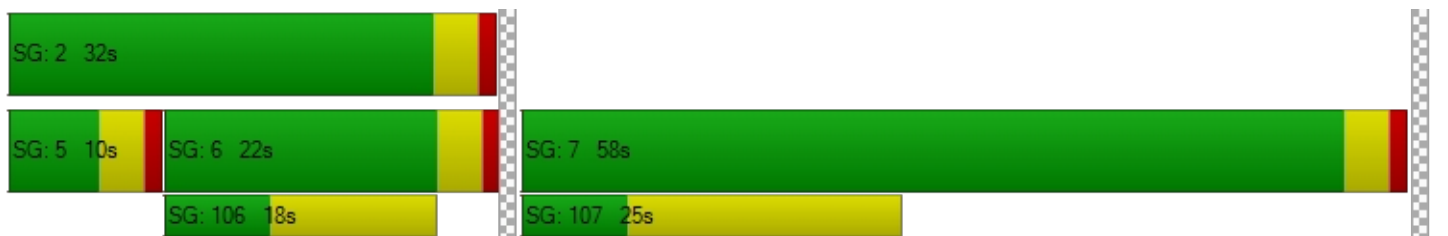
d_M, Delay for Movement [s/veh]	43.99	34.50	2.50	2.92	6.25	6.25
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.30		2.87		6.25	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.61					
Intersection LOS	B					
Intersection V/C	0.329					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.124	2.661	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.113	2.059
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):	49.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	50	2	99	2	0	7	13	539	123	131	382	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	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]	50	2	99	2	0	7	13	539	123	131	382	13
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]	13	1	26	1	0	2	3	142	32	34	101	3
Total Analysis Volume [veh/h]	53	2	104	2	0	7	14	567	129	138	402	14
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	0.39	0.02	0.16	0.01	0.00	0.01	0.01	0.01	0.00	0.15	0.00	0.00
d_M, Delay for Movement [s/veh]	47.09	49.49	26.12	30.27	36.56	9.72	8.20	0.00	0.00	9.75	0.00	0.00
Movement LOS	E	E	D	D	E	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	3.24	3.24	3.24	0.07	0.07	0.07	0.04	0.00	0.00	0.54	0.00	0.00
95th-Percentile Queue Length [ft/ln]	80.94	80.94	80.94	1.74	1.74	1.74	0.93	0.00	0.00	13.58	0.00	0.00
d_A, Approach Delay [s/veh]	33.40			14.29			0.16			2.43		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	4.82											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.302

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	70	6	18	2	8	38	60	590	174	12	450	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]	70	6	18	2	8	38	60	590	174	12	450	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	10	16	155	46	3	118	2
Total Analysis Volume [veh/h]	74	6	19	2	8	40	63	621	183	13	474	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 in	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	0.25	0.25	0.25	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.06	0.03	0.04	0.22	0.20	0.01	0.13	0.13
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800	1900	1900
c, Capacity [veh/h]	1253	1224	303	482	482	123	482	482
d1, Uniform Delay [s]	5.59	5.43	25.91	32.05	31.38	25.18	28.62	28.61
k, delay calibration	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
d2, Incremental Delay [s]	0.12	0.06	0.34	4.84	3.12	0.37	0.80	0.79
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	0.21	0.87	0.80	0.11	0.50	0.50
d, Delay for Lane Group [s/veh]	5.71	5.50	26.24	36.89	34.50	25.56	29.42	29.40
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]	0.59	0.29	1.01	8.71	7.71	0.21	4.25	4.23
50th-Percentile Queue Length [ft/ln]	14.80	7.27	25.28	217.87	192.80	5.25	106.26	105.85
95th-Percentile Queue Length [veh/ln]	1.07	0.52	1.82	13.56	12.27	0.38	7.63	7.61
95th-Percentile Queue Length [ft/ln]	26.64	13.09	45.50	338.90	306.66	9.44	190.79	190.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.71	5.71	5.71	5.50	5.50	5.50	26.24	36.10	34.50	25.56	29.41	29.40
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.71			5.50			35.05			29.31		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.27											
Intersection LOS	C											
Intersection V/C	0.302											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.930			1.885			2.830			2.634		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.723			1.642			2.275			1.966		
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):	56.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.756

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	38	293	344	112	690	17	3	52	80	1192	113	301
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	293	344	112	690	17	3	52	80	1192	113	301
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]	10	77	91	29	182	4	1	14	21	314	30	79
Total Analysis Volume [veh/h]	40	308	362	118	726	18	3	55	84	1255	119	317
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 in	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]	20	35	35	10	25	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	48	91	6	50	50	1	11	39	49	49
g / C, Green / Cycle	0.04	0.40	0.76	0.05	0.41	0.41	0.01	0.09	0.32	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.02	0.08	0.19	0.03	0.19	0.01	0.00	0.07	0.37	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	1800	1900	3400	1900	1900
c, Capacity [veh/h]	68	1525	1442	172	1574	787	10	172	1103	777	777
d1, Uniform Delay [s]	56.85	23.41	4.30	56.06	25.46	20.79	59.44	53.60	40.55	23.68	23.68
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
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
d2, Incremental Delay [s]	7.89	0.30	0.42	4.80	0.97	0.05	14.78	8.75	65.53	0.19	0.19
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	0.59	0.20	0.25	0.69	0.46	0.02	0.29	0.81	1.14	0.28	0.28
d, Delay for Lane Group [s/veh]	64.75	23.71	4.72	60.86	26.44	20.85	74.23	62.35	106.08	23.88	23.88
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]	1.31	2.77	2.05	1.80	7.17	0.29	0.13	4.47	25.70	4.07	4.07
50th-Percentile Queue Length [ft/ln]	32.67	69.26	51.33	45.11	179.17	7.33	3.30	111.67	642.42	101.70	101.70
95th-Percentile Queue Length [veh/ln]	2.35	4.99	3.70	3.25	11.56	0.53	0.24	7.93	36.89	7.32	7.32
95th-Percentile Queue Length [ft/ln]	58.81	124.67	92.40	81.19	288.93	13.20	5.94	198.32	922.35	183.07	183.07

Movement, Approach, & Intersection Results

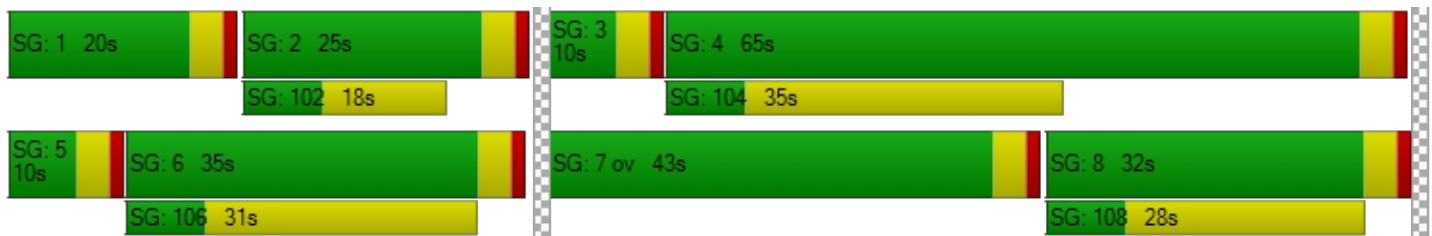
d_M, Delay for Movement [s/veh]	64.75	23.71	4.72	60.86	26.44	20.85	74.23	62.35	62.35	106.08	23.88	23.88
Movement LOS	E	C	A	E	C	C	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	16.34			31.03			62.60			84.89		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	56.03											
Intersection LOS	E											
Intersection V/C	0.756											

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]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersection	3.218	2.988	2.092	2.949
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	350	467	1017
d_b, Bicycle Delay [s]	33.00	40.84	35.27	14.50
I_b,int, Bicycle LOS Score for Intersection	2.145	2.271	1.794	4.350
Bicycle LOS	B	B	A	E

Sequence

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



APPENDIX F-III

**YEAR 2040 WITH PROJECT WITH MITIGATION
TRAFFIC CONDITIONS**

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

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

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	1	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]	50	0	425	300	28	36	0	922	31	260	446	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]	50	0	425	300	28	36	0	922	31	260	446	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]	13	0	112	79	7	9	0	243	8	68	117	0
Total Analysis Volume [veh/h]	53	0	447	316	29	38	0	971	33	274	469	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 in	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]	12.00

Phasing & Timing

Control Type	Split	Permiss	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	12	12	0	29	0	0	30	0	19	49	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	L	C
C, Cycle Length [s]	90	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	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	17	56	17	17	17	26	26	44	44
g / C, Green / Cycle	0.19	0.62	0.19	0.19	0.19	0.29	0.29	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.08	0.11	0.02	0.26	0.02	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	3800	1900	1800	3800
c, Capacity [veh/h]	337	1185	377	411	356	1092	546	566	1869
d1, Uniform Delay [s]	30.64	8.33	32.49	33.30	30.35	30.73	23.28	13.72	13.27
k, delay calibration	0.50	0.50	0.50	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]	0.99	0.92	3.20	3.79	0.60	2.71	0.05	0.64	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	0.16	0.38	0.40	0.47	0.11	0.89	0.06	0.48	0.25
d, Delay for Lane Group [s/veh]	31.63	9.25	35.69	37.09	30.95	33.44	23.33	14.36	13.34
Lane Group LOS	C	A	D	D	C	C	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.03	3.98	3.20	4.14	0.73	9.72	0.49	3.06	2.47
50th-Percentile Queue Length [ft/ln]	25.81	99.48	79.96	103.60	18.17	242.88	12.15	76.61	61.77
95th-Percentile Queue Length [veh/ln]	1.86	7.16	5.76	7.46	1.31	14.83	0.87	5.52	4.45
95th-Percentile Queue Length [ft/ln]	46.45	179.07	143.94	186.47	32.70	370.68	21.87	137.89	111.19

Movement, Approach, & Intersection Results

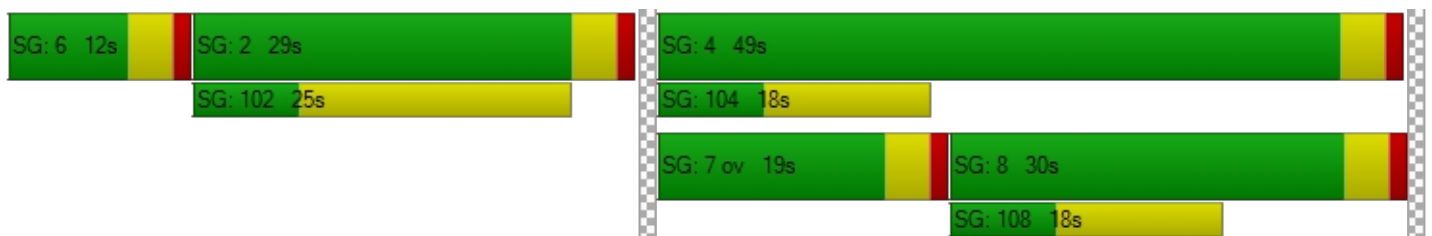
d_M, Delay for Movement [s/veh]	31.63	0.00	9.25	36.41	37.09	30.95	0.00	33.44	23.33	14.36	13.34	0.00
Movement LOS	C		A	D	D	C		C	C	B	B	
d_A, Approach Delay [s/veh]	11.62			35.93			33.11			13.72		
Approach LOS	B			D			C			B		
d_I, Intersection Delay [s/veh]	23.95											
Intersection LOS	C											
Intersection V/C	0.762											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	34.67	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.377	2.239	2.757	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	178	556	578	1000
d_b, Bicycle Delay [s]	37.36	23.47	22.76	11.25
I_b,int, Bicycle LOS Score for Intersection	1.560	2.192	2.388	2.173
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 4: Twin Knolls Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	12.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.300

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	52	0	194	7	0	8	8	324	49	76	342	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
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	0	194	7	0	8	8	324	49	76	342	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]	14	0	51	2	0	2	2	85	13	20	90	3
Total Analysis Volume [veh/h]	55	0	204	7	0	8	8	341	52	80	360	13
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 in	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	8	0	0	4	0	0	2	0	0	6	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	58	0	0	58	0	0	32	0	0	32	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]	17	17	65	65	65	65	65	65
g / C, Green / Cycle	0.19	0.19	0.72	0.72	0.72	0.72	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.17	0.01	0.01	0.11	0.11	0.08	0.10	0.10
s, saturation flow rate [veh/h]	1569	1143	1009	1870	1785	991	1870	1847
c, Capacity [veh/h]	343	273	741	1352	1291	727	1352	1336
d1, Uniform Delay [s]	35.33	29.85	5.38	3.85	3.85	5.90	3.82	3.82
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.39	0.08	0.03	0.23	0.25	0.31	0.21	0.22
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	0.75	0.05	0.01	0.15	0.15	0.11	0.14	0.14
d, Delay for Lane Group [s/veh]	38.72	29.93	5.40	4.08	4.10	6.20	4.03	4.04
Lane Group LOS	D	C	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	5.71	0.27	0.05	0.84	0.82	0.51	0.78	0.77
50th-Percentile Queue Length [ft/ln]	142.65	6.73	1.15	20.89	20.40	12.68	19.47	19.33
95th-Percentile Queue Length [veh/ln]	9.62	0.48	0.08	1.50	1.47	0.91	1.40	1.39
95th-Percentile Queue Length [ft/ln]	240.58	12.11	2.08	37.61	36.73	22.83	35.04	34.80

Movement, Approach, & Intersection Results

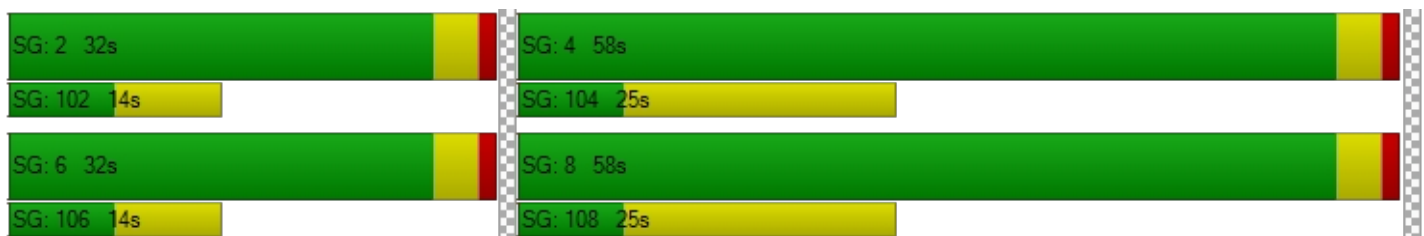
d_M, Delay for Movement [s/veh]	38.72	38.72	38.72	29.93	29.93	29.93	5.40	4.09	4.10	6.20	4.04	4.04
Movement LOS	D	D	D	C	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	38.72			29.93			4.11			4.42		
Approach LOS	D			C			A			A		
d_I, Intersection Delay [s/veh]	12.53											
Intersection LOS	B											
Intersection V/C	0.300											

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]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.019	1.743	2.619	2.603
Crosswalk LOS	B	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]	1200	1200	622	622
d_b, Bicycle Delay [s]	7.20	7.20	21.36	21.36
I_b,int, Bicycle LOS Score for Intersection	1.987	1.584	1.890	1.933
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 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	102.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

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	1	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]	44	0	216	1110	129	114	0	459	86	262	273	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]	44	0	216	1110	129	114	0	459	86	262	273	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]	12	0	57	292	34	30	0	121	23	69	72	0
Total Analysis Volume [veh/h]	46	0	227	1168	136	120	0	483	91	276	287	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 in	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	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	10	10	0	29	0	0	25	0	56	81	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	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	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	34	78	34	34	34	18	18	40	40
g / C, Green / Cycle	0.28	0.65	0.28	0.28	0.28	0.15	0.15	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.36	0.36	0.06	0.13	0.05	0.15	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	3800	1900	1800	3800
c, Capacity [veh/h]	512	1233	512	512	540	572	286	467	1258
d1, Uniform Delay [s]	31.56	8.41	42.98	42.98	32.82	49.64	45.51	31.73	29.06
k, delay calibration	0.50	0.50	0.50	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]	0.35	0.33	137.64	137.64	0.95	3.49	0.63	1.19	0.09
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	0.09	0.18	1.27	1.27	0.22	0.84	0.32	0.59	0.23
d, Delay for Lane Group [s/veh]	31.90	8.74	180.62	180.62	33.77	53.13	46.14	32.93	29.15
Lane Group LOS	C	A	F	F	C	D	D	C	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.03	2.33	34.42	34.42	2.80	7.13	2.42	6.27	2.93
50th-Percentile Queue Length [ft/ln]	25.72	58.27	860.59	860.59	69.99	178.30	60.45	156.71	73.18
95th-Percentile Queue Length [veh/ln]	1.85	4.20	50.52	50.52	5.04	11.51	4.35	10.37	5.27
95th-Percentile Queue Length [ft/ln]	46.29	104.89	1262.90	1262.90	125.99	287.79	108.81	259.37	131.72

Movement, Approach, & Intersection Results

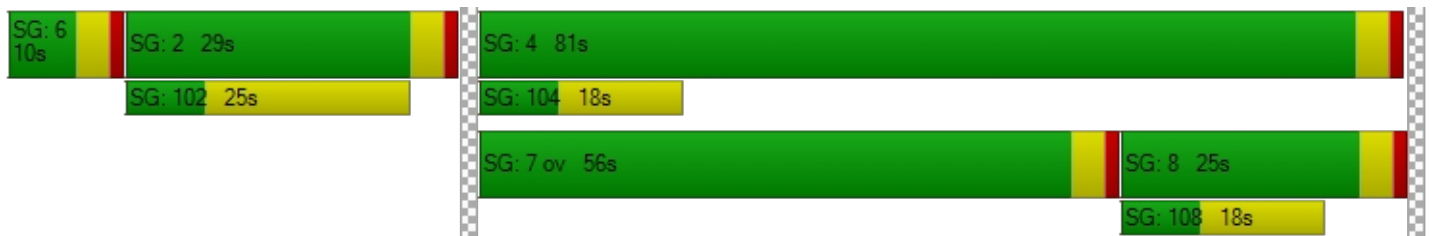
d_M, Delay for Movement [s/veh]	31.90	0.00	8.74	180.62	180.62	33.77	0.00	53.13	46.14	32.93	29.15	0.00
Movement LOS	C		A	F	F	C		D	D	C	C	
d_A, Approach Delay [s/veh]	12.64			168.25			52.02			31.00		
Approach LOS	B			F			D			C		
d_I, Intersection Delay [s/veh]	102.45											
Intersection LOS	F											
Intersection V/C	0.726											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.314	2.550	2.614	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	417	350	1283
d_b, Bicycle Delay [s]	54.15	37.60	40.84	7.70
I_b,int, Bicycle LOS Score for Intersection	1.560	3.909	2.033	2.024
Bicycle LOS	A	D	B	B

Sequence

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



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

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.323

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Base Volume Input [veh/h]	50	2	99	2	0	7	13	539	123	131	382	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	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]	50	2	99	2	0	7	13	539	123	131	382	13
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]	13	1	26	1	0	2	3	142	32	34	101	3
Total Analysis Volume [veh/h]	53	2	104	2	0	7	14	567	129	138	402	14
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 in	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	8	0	0	4	0	0	2	0	0	6	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	72	0	0	72	0	0	18	0	0	18	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]	11	11	71	71	71	71	71	71
g / C, Green / Cycle	0.12	0.12	0.79	0.79	0.79	0.79	0.79	0.79
(v / s)_i Volume / Saturation Flow Rate	0.10	0.01	0.01	0.19	0.19	0.18	0.11	0.11
s, saturation flow rate [veh/h]	1562	1683	970	1870	1752	749	1870	1848
c, Capacity [veh/h]	246	256	785	1473	1380	606	1473	1456
d1, Uniform Delay [s]	38.34	34.73	3.42	2.50	2.50	4.90	2.28	2.28
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.85	0.06	0.04	0.39	0.42	0.87	0.20	0.20
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	0.65	0.04	0.02	0.24	0.24	0.23	0.14	0.14
d, Delay for Lane Group [s/veh]	41.19	34.78	3.46	2.89	2.93	5.77	2.48	2.48
Lane Group LOS	D	C	A	A	A	A	A	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No
50th-Percentile Queue Length [veh/ln]	3.56	0.18	0.06	0.93	0.88	0.80	0.49	0.49
50th-Percentile Queue Length [ft/ln]	88.96	4.40	1.39	23.16	22.08	20.06	12.22	12.13
95th-Percentile Queue Length [veh/ln]	6.40	0.32	0.10	1.67	1.59	1.44	0.88	0.87
95th-Percentile Queue Length [ft/ln]	160.12	7.92	2.50	41.69	39.74	36.12	22.00	21.84

Movement, Approach, & Intersection Results

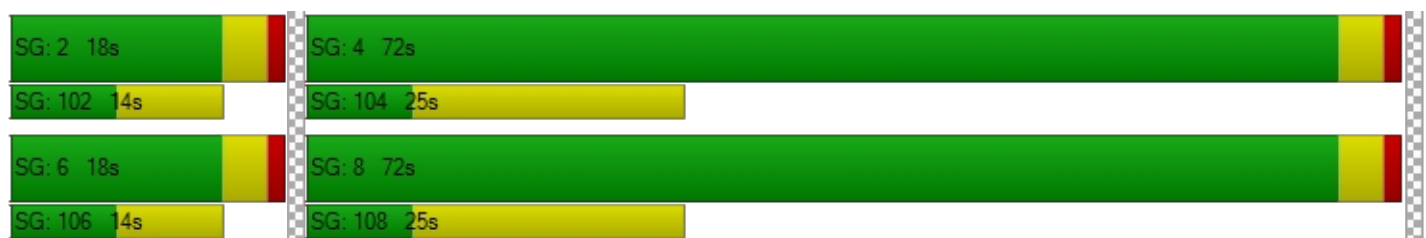
d_M, Delay for Movement [s/veh]	41.19	41.19	41.19	34.78	34.78	34.78	3.46	2.91	2.93	5.77	2.48	2.48
Movement LOS	D	D	D	C	C	C	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	41.19			34.78			2.92			3.30		
Approach LOS	D			C			A			A		
d_I, Intersection Delay [s/veh]	7.52											
Intersection LOS	A											
Intersection V/C	0.323											

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]	34.67	34.67	34.67	34.67
I_p,int, Pedestrian LOS Score for Intersection	2.118	1.753	2.718	2.661
Crosswalk LOS	B	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]	1511	1511	311	311
d_b, Bicycle Delay [s]	2.69	2.69	32.09	32.09
I_b,int, Bicycle LOS Score for Intersection	1.822	1.574	2.145	2.017
Bicycle LOS	A	A	B	B

Sequence

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



APPENDIX G
TRAFFIC SIGNAL WARRANT ANALYSIS
WORKSHEETS

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 1 of 5)

COUNT DATE Existing (Year 2021)

DIST _____ CO _____ RTE _____ PM _____

Major St: Butterfield Ranch Road Critical Approach Speed 45 mph

Minor St: Twin Knolls Drive Critical Approach Speed 25 mph

Speed limit or critical speed on major street traffic > 40 mph..... or } **RURAL (R)**

In built up area of isolated community of < 10,000 population..... } **URBAN (U)**

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES NO
 (Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES NO
 80% SATISFIED YES NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	U	R	U	R									
	1		2 or More		8:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	Hour
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	728	857	776	972	1099	1261	1356	913	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	147	100	100	105	68	96	128	91	

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES NO
 80% SATISFIED YES NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)												
	U	R	U	R									
	1		2 or More		8:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	Hour
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	728	857	776	972	1099	1261	1356	913	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	147	100	100	105	68	96	128	91	

Combination of Conditions A & B SATISFIED YES NO

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC	x	
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 5)

WARRANT 2 - Four Hour Vehicular Volume

SATISFIED* YES NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	2 or		14:00	15:00	16:00	17:00	Hour
	One	More					
Both Approaches - Major Street		x	972	1099	1261	1356	
Higher Approach - Minor Street	x		105	68	96	128	

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**WARRANT 3 - Peak Hour
 (Part A or Part B must be satisfied)**

SATISFIED YES NO

PART A

SATISFIED YES NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; <u>AND</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

PART B

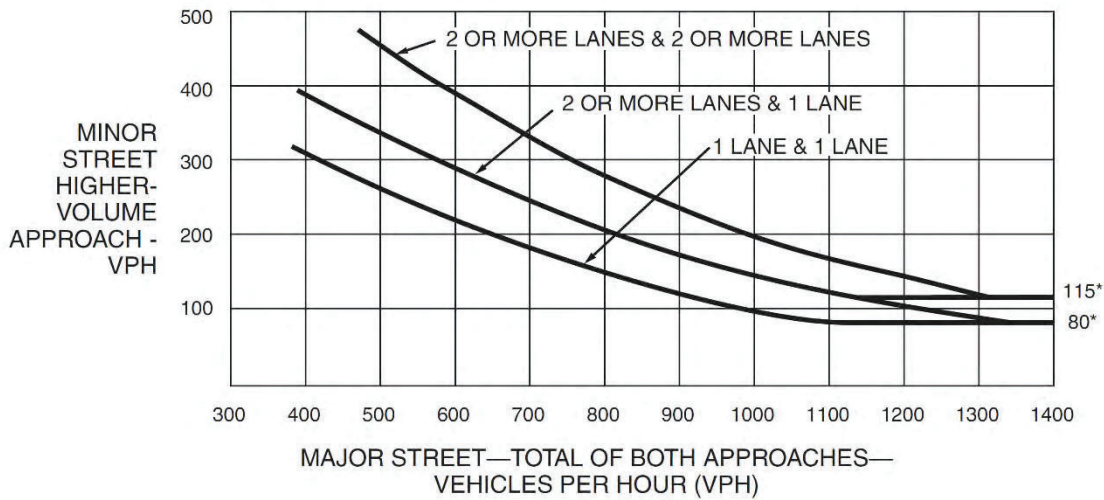
SATISFIED YES NO

APPROACH LANES	2 or		17:00	Hour
	One	More		
Both Approaches - Major Street		x	1356	
Higher Approach - Minor Street	x		128	

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

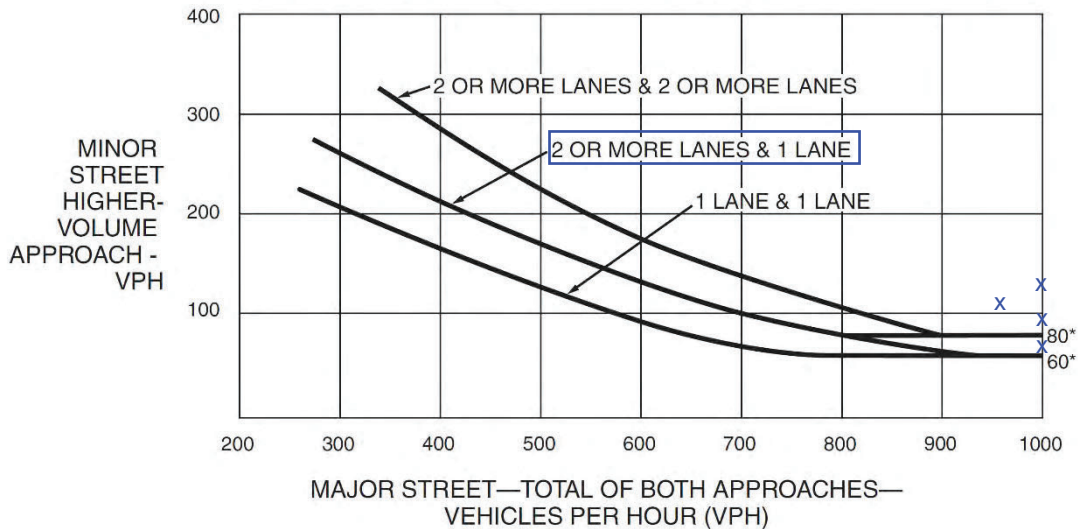
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



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

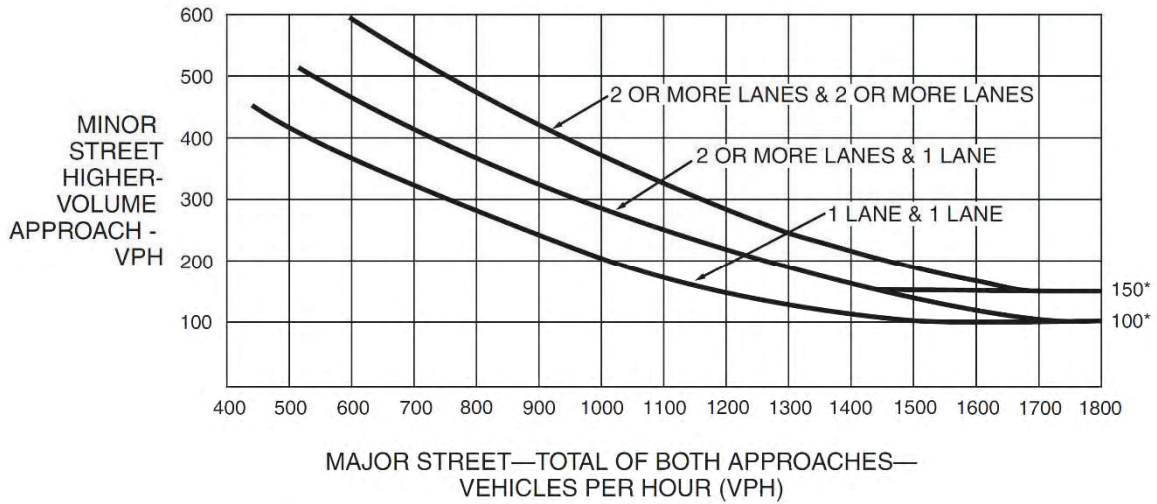
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



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

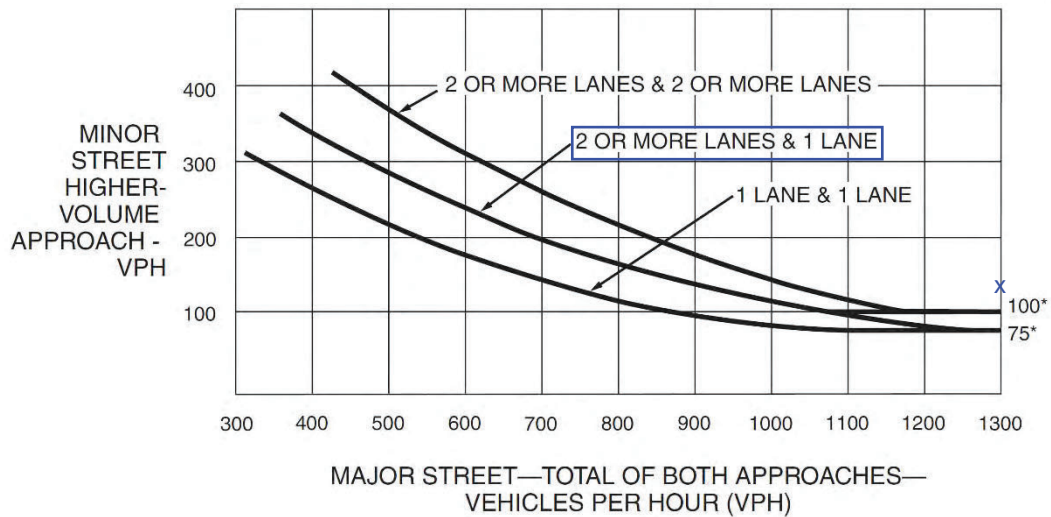
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 3 of 5)

**WARRANT 4 - Pedestrian Volume
 (Parts 1 and 2 Must Be Satisfied)**

SATISFIED YES NO

Part 1 (Parts A or B must be satisfied)

Hours --> 14:00 15:00 16:00 17:00

A. Vehicles per hour for any 4 hours	972	1099	1261	1365
Pedestrians per hour for any 4 hours	0	3	3	0

Figure 4C-5 or Figure 4C-6
 SATISFIED YES NO

Hours --> 14:00 15:00 16:00 17:00

B. Vehicles per hour for any 1 hour	972	1099	1261	1365
Pedestrians per hour for any 1 hour	0	3	3	0

Figure 4C-7 or Figure 4C-8
 SATISFIED YES NO

Part 2

SATISFIED YES NO

<u>AND</u> , The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<u>OR</u> , The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes <input type="checkbox"/> No <input type="checkbox"/>

**WARRANT 5 - School Crossing
 (Parts A and B Must Be Satisfied)**

SATISFIED YES NO
 *NOT APPLICABLE

**Part A
 Gap/Minutes and # of Children**

SATISFIED YES NO

Gaps vs Minutes	Minutes Children Using Crossing	Hour
	Number of Adequate Gaps	
School Age Pedestrians Crossing Street / hr		

Gaps < Minutes YES NO
AND Children > 20/hr YES NO

<u>AND</u> , Consideration has been given to less restrictive remedial measures.	Yes <input type="checkbox"/> No <input type="checkbox"/>
--	--

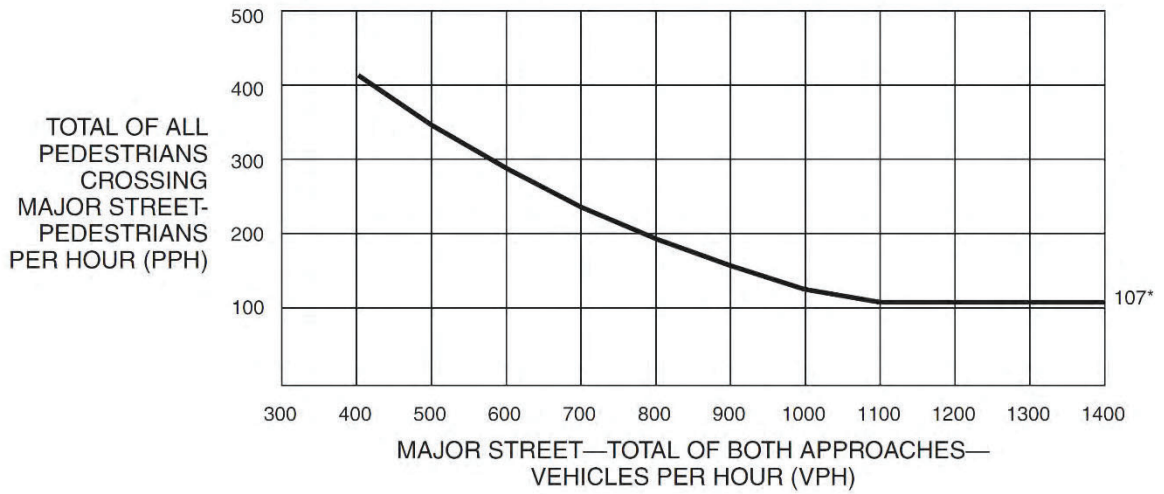
Part B

SATISFIED YES NO

The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes <input type="checkbox"/> No <input type="checkbox"/>
<u>OR</u> , The proposed signal will not restrict the progressive movement of traffic.	Yes <input type="checkbox"/> No <input type="checkbox"/>

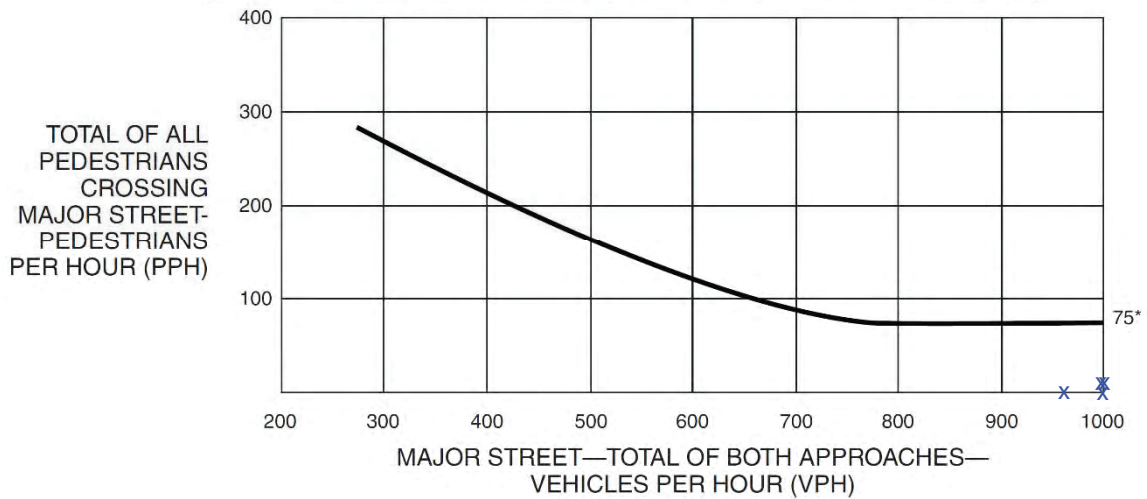
The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume



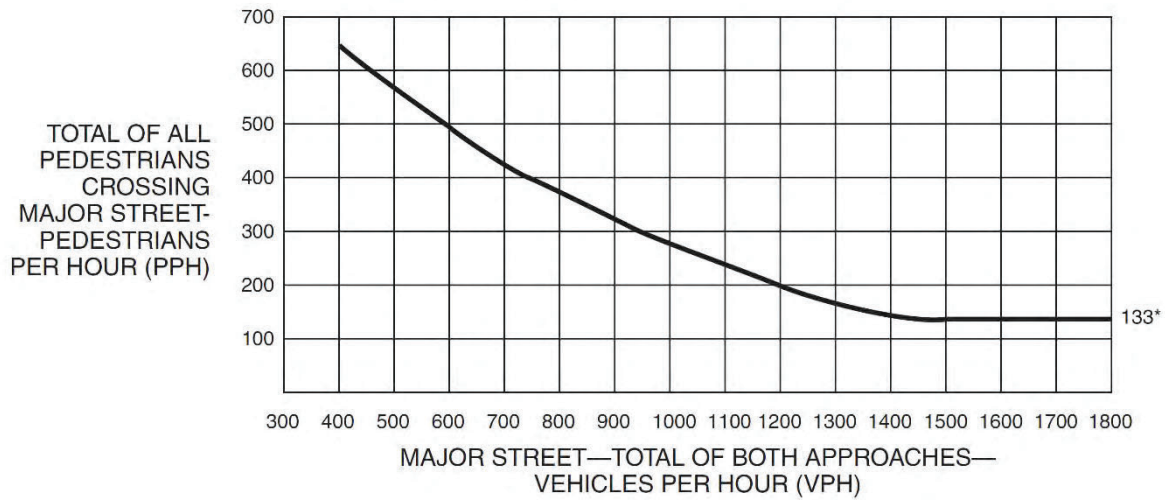
*Note: 107 pph applies as the lower threshold volume.

Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)



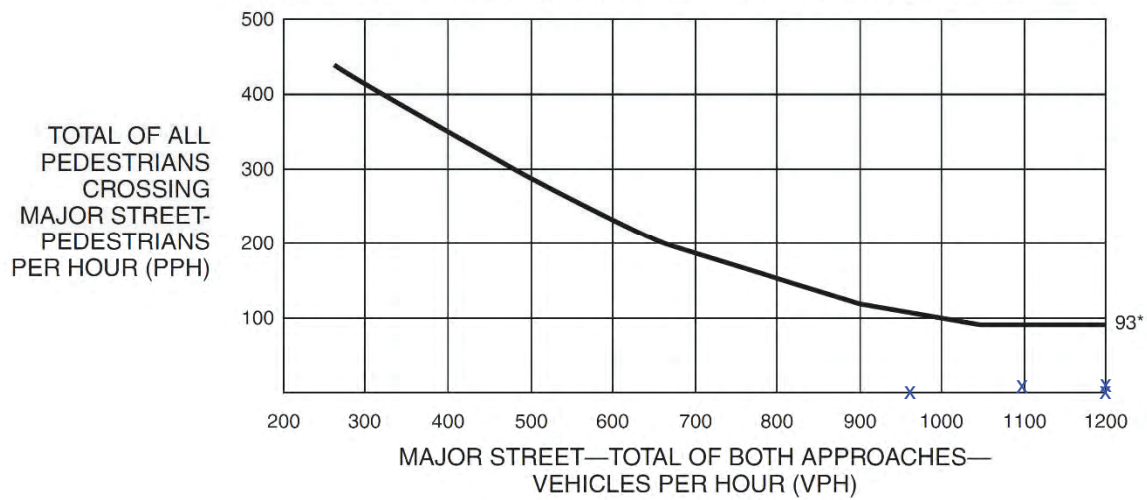
*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)



*Note: 93 pph applies as the lower threshold volume.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 5)

**WARRANT 6 - Coordinated Signal System
 (All Parts Must Be Satisfied)**

SATISFIED YES NO

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 1000 ft	N <u>N/A</u> ft, S <u>N/A</u> ft, E <u>675</u> ft, W <u>2200</u> ft	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		

**WARRANT 7 - Crash Experience Warrant
 (All Parts Must Be Satisfied)**

SATISFIED YES NO

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
REQUIREMENTS	Number of crashes reported within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
5 OR MORE			
REQUIREMENTS	CONDITIONS	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume		✓
	OR, Warrant 1, Condition B - Interruption of Continuous Traffic		✗
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 80% of Figure 4C-5 through Figure 4C-8		

**WARRANT 8 - Roadway Network
 (All Parts Must Be Satisfied)**

SATISFIED YES NO

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour _____ Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes <input type="checkbox"/> No <input type="checkbox"/>
	OR During Each of Any 5 Hrs. of a Sat. or Sun _____ Veh/Hr		
CHARACTERISTICS OF MAJOR ROUTES		MAJOR ROUTE A	MAJOR ROUTE B
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 5 of 5)

*NOT APPLICABLE

**WARRANT 9 - Intersection Near a Grade Crossing
 (Both Parts A and B Must Be Satisfied)**

SATISFIED YES NO

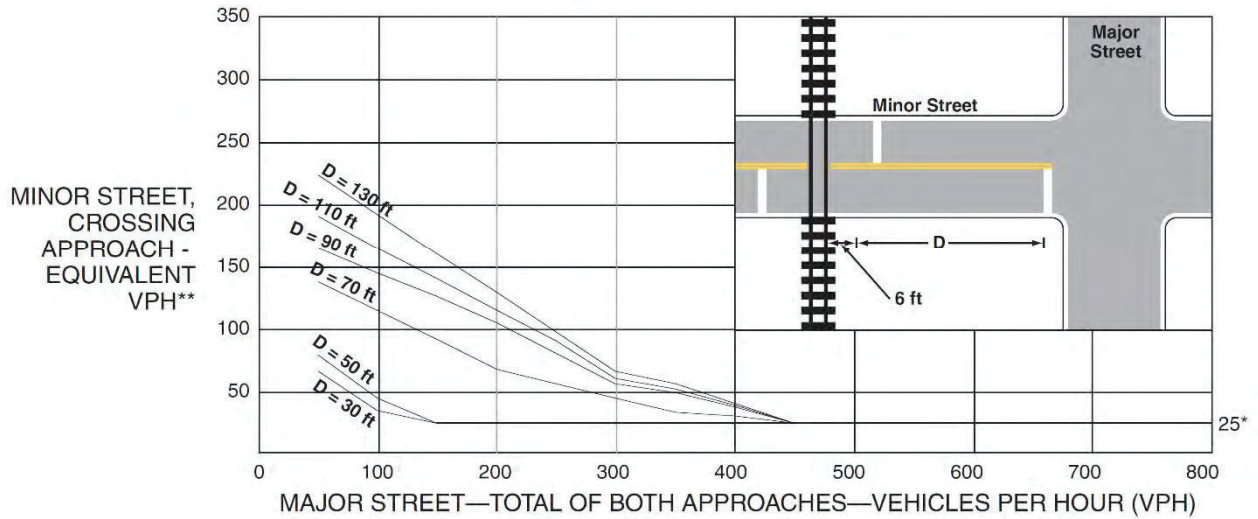
<p><u>PART A</u></p> <p>A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach. Track Center Line to Limit Line _____ ft</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p><u>PART B</u></p> <p>There is one minor street approach lane at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-9.</p> <p>Major Street - Total of both approaches: _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p><u>OR</u>, There are two or more minor street approach lanes at the track crossing - During the highest traffic volume hour during which rail traffic uses the crossing, the plotted point falls above the applicable curve in Figure 4C-10.</p> <p>Major Street - Total of both approaches : _____ VPH Minor Street - Crosses the track (one direction only, approaching the intersection): _____ VPH X AF (Use Tables 4C-2, 3, & 4 below to calculate AF) = _____ VPH</p>	<p>Yes <input type="checkbox"/> No <input type="checkbox"/></p>

The minor street approach volume may be multiplied by up to three following adjustment factors (AF) as described in Section 4C.10.

- 1- Number of Rail Traffic per Day _____ Adjustment factor from table 4C-2 _____
- 2- Percentage of High-Occupancy Buses on Minor Street Approach _____ Adjustment factor from table 4C-3 _____
- 3- Percentage of Tractor-Trailer Trucks on Minor Street Approach _____ Adjustment factor from table 4C-4 _____

NOTE: If no data is available or known, then use AF = 1 (no adjustment)

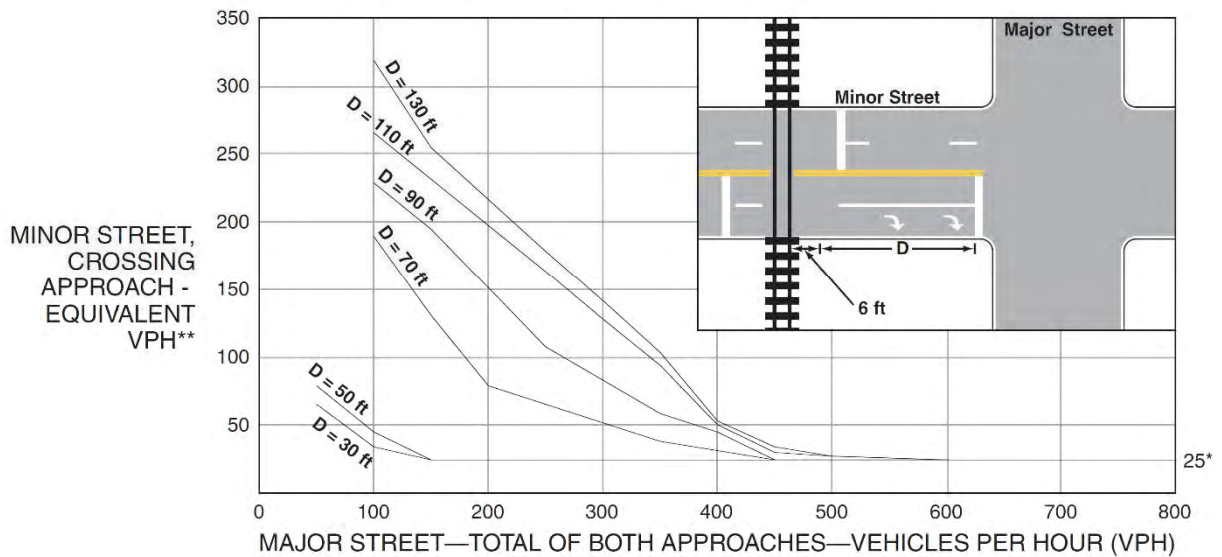
**Figure 4C-9. Warrant 9, Intersection Near a Grade Crossing
 (One Approach Lane at the Track Crossing)**



* 25 vph applies as the lower threshold volume

** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate

**Figure 4C-10. Warrant 9, Intersection Near a Grade Crossing
 (Two or More Approach Lanes at the Track Crossing)**



* 25 vph applies as the lower threshold volume

** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate

APPENDIX H

ALTERNATIVE PROJECT ANALYSIS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX H-1

EXISTING WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.207

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	102	0	27	42	66	66	10	0	0	6	77
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	102	0	27	42	66	66	10	0	0	6	77
Peak Hour Factor	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850	0.7850
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	32	0	9	13	21	21	3	0	0	2	25
Total Analysis Volume [veh/h]	3	130	0	34	54	84	84	13	0	0	8	98
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	779	833	729	854
Degree of Utilization, x	0.17	0.21	0.13	0.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.61	0.77	0.46	0.42
95th-Percentile Queue Length [ft]	15.31	19.35	11.44	10.58
Approach Delay [s/veh]	8.57	8.45	8.69	7.81
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.39			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	57.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

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]	51	0	354	243	26	32	0	736	30	221	302	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]	51	0	354	243	26	32	0	736	30	221	302	0
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	1.0000	0.9140	0.9140	0.9140	0.9140	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]	14	0	97	66	7	9	0	201	8	60	83	0
Total Analysis Volume [veh/h]	56	0	387	266	28	35	0	805	33	242	330	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 in	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]	35	35	0	0	25	0	0	32	0	28	60	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	
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	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]	28	28	28	28	28	30	30	19	53
g / C, Green / Cycle	0.23	0.23	0.23	0.23	0.23	0.25	0.25	0.16	0.44
(v / s)_i Volume / Saturation Flow Rate	0.03	0.22	0.09	0.09	0.02	0.23	0.23	0.14	0.09
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	390	413	390	390	413	445	445	272	1587
d1, Uniform Delay [s]	36.85	45.40	39.00	39.03	36.35	44.37	44.37	49.39	20.68
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.40	0.40	0.13	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]	0.77	30.79	2.74	2.77	0.40	26.22	26.22	11.54	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	0.14	0.94	0.37	0.38	0.08	0.94	0.94	0.89	0.21
d, Delay for Lane Group [s/veh]	37.62	76.19	41.74	41.80	36.75	70.59	70.59	60.93	20.75
Lane Group LOS	D	E	D	D	D	E	E	E	C
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.39	14.66	3.91	3.95	0.85	15.01	15.01	7.77	2.76
50th-Percentile Queue Length [ft/ln]	34.77	366.58	97.82	98.73	21.30	375.22	375.22	194.33	68.95
95th-Percentile Queue Length [veh/ln]	2.50	20.94	7.04	7.11	1.53	21.36	21.36	12.35	4.96
95th-Percentile Queue Length [ft/ln]	62.58	523.58	176.08	177.71	38.33	534.06	534.06	308.64	124.11

Movement, Approach, & Intersection Results

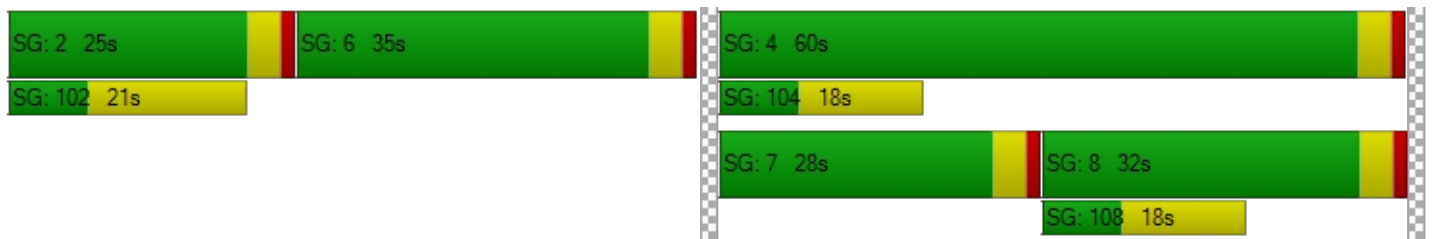
d_M, Delay for Movement [s/veh]	37.62	0.00	76.19	41.77	41.80	36.75	0.00	70.59	70.59	60.93	20.75	0.00
Movement LOS	D		E	D	D	D		E	E	E	C	
d_A, Approach Delay [s/veh]	71.31			41.24				70.59		37.75		
Approach LOS	E			D				E		D		
d_I, Intersection Delay [s/veh]	57.70											
Intersection LOS	E											
Intersection V/C	0.752											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.237		2.238		2.605		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]	517		350		467		933
d_b, Bicycle Delay [s]	33.00		40.84		35.27		17.07
I_b,int, Bicycle LOS Score for Intersection	1.560		2.102		2.251		2.032
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):	15.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.346

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]	264	42	49	410	297	47
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]	264	42	49	410	297	47
Peak Hour Factor	0.8980	0.8980	0.8980	0.8980	0.8980	0.8980
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	73	12	14	114	83	13
Total Analysis Volume [veh/h]	294	47	55	457	331	52
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 in	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	56	56
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]	339	359	1240	2562	1109	1109
d1, Uniform Delay [s]	34.89	29.63	3.87	4.28	7.41	7.41
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.74	0.16	0.07	0.15	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	0.04	0.18	0.17	0.17
d, Delay for Lane Group [s/veh]	41.64	29.80	3.93	4.44	7.75	7.75
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.81	0.85	0.23	1.01	1.39	1.39
50th-Percentile Queue Length [ft/ln]	170.21	21.36	5.75	25.16	34.80	34.80
95th-Percentile Queue Length [veh/ln]	11.09	1.54	0.41	1.81	2.51	2.51
95th-Percentile Queue Length [ft/ln]	277.19	38.45	10.35	45.29	62.65	62.65

Movement, Approach, & Intersection Results

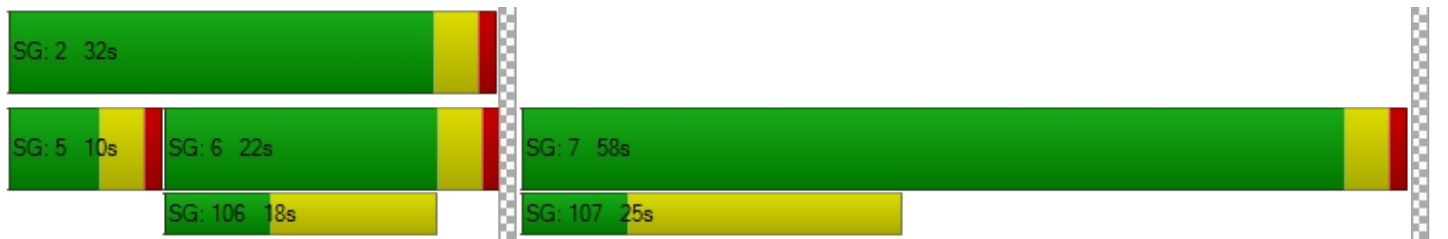
d_M, Delay for Movement [s/veh]	41.64	29.80	3.93	4.44	7.75	7.75
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	40.01		4.38		7.75	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.26					
Intersection LOS	B					
Intersection V/C	0.346					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.111	2.560	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	1.982	1.876
Bicycle LOS	A	A	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):	19.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T			T T		
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]	35	0	166	7	0	7	7	268	37	68	277	10
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]	35	0	166	7	0	7	7	268	37	68	277	10
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
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	48	2	0	2	2	78	11	20	81	3
Total Analysis Volume [veh/h]	41	0	193	8	0	8	8	312	43	79	322	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	0.13	0.00	0.23	0.03	0.00	0.01	0.01	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	19.25	21.01	12.37	19.57	18.62	9.64	7.97	0.00	0.00	8.21	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.63	1.63	1.63	0.13	0.13	0.13	0.02	0.00	0.00	0.21	0.00	0.00
95th-Percentile Queue Length [ft/ln]	40.68	40.68	40.68	3.19	3.19	3.19	0.49	0.00	0.00	5.28	0.00	0.00
d_A, Approach Delay [s/veh]	13.57			14.60			0.18			1.57		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.02											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.155

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	47	0	2	5	0	35	22	282	39	7	282	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]	47	0	2	5	0	35	22	282	39	7	282	7
Peak Hour Factor	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450	0.8450
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	7	83	12	2	83	2
Total Analysis Volume [veh/h]	56	0	2	6	0	41	26	334	46	8	334	8
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 in	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	38	0	0	38	0	0	52	0	0	52	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	0.78	0.78	0.14	0.14	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.02	0.11	0.10	0.00	0.10	0.09
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1398	1364	126	243	243	105	243	243
d1, Uniform Delay [s]	2.34	2.32	34.11	37.62	37.49	33.75	37.13	37.11
k, delay calibration	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
d2, Incremental Delay [s]	0.06	0.05	0.80	5.73	5.09	0.30	3.70	3.65
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	0.21	0.79	0.77	0.08	0.70	0.70
d, Delay for Lane Group [s/veh]	2.39	2.37	34.91	43.34	42.58	34.05	40.83	40.75
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	0.50	4.28	4.11	0.15	3.67	3.64
50th-Percentile Queue Length [ft/ln]	3.94	3.18	12.60	106.96	102.87	3.85	91.68	91.12
95th-Percentile Queue Length [veh/ln]	0.28	0.23	0.91	7.67	7.41	0.28	6.60	6.56
95th-Percentile Queue Length [ft/ln]	7.09	5.72	22.69	191.76	185.16	6.92	165.02	164.02

Movement, Approach, & Intersection Results

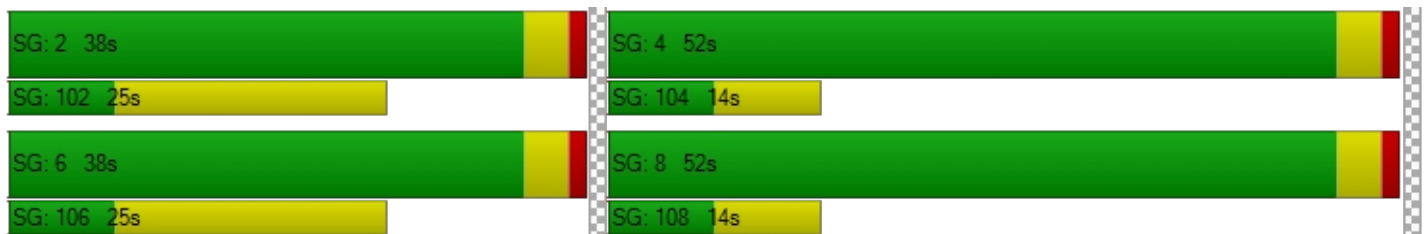
d_M, Delay for Movement [s/veh]	2.39	2.39	2.39	2.37	2.37	2.37	34.91	43.02	42.58	34.05	40.79	40.75
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.39			2.37			42.45			40.64		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.83											
Intersection LOS	D											
Intersection V/C	0.155											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.799			1.804			2.624			2.510		
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]	756			756			1067			1067		
d_b, Bicycle Delay [s]	17.42			17.42			9.80			9.80		
I_b,int, Bicycle LOS Score for Intersection	1.655			1.637			1.895			1.848		
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):	17.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.360

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	30	429	287	75	335	80	55	62	36	74	36	48
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]	30	429	287	75	335	80	55	62	36	74	36	48
Peak Hour Factor	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260	0.8260
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	130	87	23	101	24	17	19	11	22	11	15
Total Analysis Volume [veh/h]	36	519	347	91	406	97	67	75	44	90	44	58
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 in	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]	20	35	35	10	25	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	59	69	6	61	61	5	8	6	9	9
g / C, Green / Cycle	0.04	0.62	0.73	0.06	0.64	0.64	0.05	0.09	0.06	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.19	0.03	0.11	0.05	0.04	0.07	0.03	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]	68	2245	1313	187	2312	1156	91	154	205	173	173
d1, Uniform Delay [s]	44.80	7.87	4.31	43.41	6.87	6.44	44.37	42.59	42.89	40.05	39.95
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
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
d2, Incremental Delay [s]	6.24	0.24	0.49	1.95	0.17	0.14	10.92	7.91	1.48	0.99	0.88
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	0.53	0.23	0.26	0.49	0.18	0.08	0.74	0.77	0.44	0.31	0.28
d, Delay for Lane Group [s/veh]	51.04	8.12	4.80	45.36	7.03	6.58	55.29	50.50	44.37	41.05	40.83
Lane Group LOS	D	A	A	D	A	A	E	D	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.91	1.93	1.61	1.03	1.29	0.60	1.79	2.99	1.03	1.17	1.07
50th-Percentile Queue Length [ft/ln]	22.79	48.21	40.17	25.69	32.18	14.97	44.70	74.81	25.82	29.36	26.81
95th-Percentile Queue Length [veh/ln]	1.64	3.47	2.89	1.85	2.32	1.08	3.22	5.39	1.86	2.11	1.93
95th-Percentile Queue Length [ft/ln]	41.02	86.77	72.30	46.24	57.92	26.94	80.45	134.66	46.47	52.84	48.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.04	8.12	4.80	45.36	7.03	6.58	55.29	50.50	50.50	44.37	41.05	40.86
Movement LOS	D	A	A	D	A	A	E	D	D	D	D	D
d_A, Approach Delay [s/veh]	8.55			12.83			52.23			42.55		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.73											
Intersection LOS	B											
Intersection V/C	0.360											

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]	37.14			37.14			37.14			37.14		
I_p,int, Pedestrian LOS Score for Intersection	2.846			2.912			2.100			2.608		
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]	653			442			758			737		
d_b, Bicycle Delay [s]	21.56			28.82			18.32			18.95		
I_b,int, Bicycle LOS Score for Intersection	2.304			2.050			1.867			1.876		
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):	8.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.305

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	70	1	44	118	31	36	14	6	0	3	44
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	70	1	44	118	31	36	14	6	0	3	44
Peak Hour Factor	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610	0.7610
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	23	0	14	39	10	12	5	2	0	1	14
Total Analysis Volume [veh/h]	1	92	1	58	155	41	47	18	8	0	4	58
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	795	834	740	844
Degree of Utilization, x	0.12	0.30	0.10	0.07

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	1.29	0.33	0.24
95th-Percentile Queue Length [ft]	10.02	32.27	8.18	5.93
Approach Delay [s/veh]	8.14	9.20	8.40	7.60
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.66			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	53.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.696

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]	43	0	196	704	119	103	0	341	89	176	220	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]	43	0	196	704	119	103	0	341	89	176	220	0
Peak Hour Factor	0.9150	0.9150	0.9150	0.9150	0.9150	0.9150	1.0000	0.9150	0.9150	0.9150	0.9150	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]	12	0	54	192	33	28	0	93	24	48	60	0
Total Analysis Volume [veh/h]	47	0	214	769	130	113	0	373	97	192	240	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 in	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]	35	35	35	35	35	18	18	16	38
g / C, Green / Cycle	0.29	0.29	0.29	0.29	0.29	0.15	0.15	0.13	0.32
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.26	0.26	0.06	0.13	0.13	0.11	0.07
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	496	525	496	496	525	274	274	222	1139
d1, Uniform Delay [s]	30.98	34.19	40.95	40.95	32.14	49.63	49.63	51.16	30.07
k, delay calibration	0.50	0.50	0.50	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]	0.38	2.34	22.75	22.75	0.94	7.58	7.58	9.60	0.09
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	0.09	0.41	0.91	0.91	0.22	0.86	0.86	0.86	0.21
d, Delay for Lane Group [s/veh]	31.36	36.52	63.70	63.70	33.08	57.20	57.20	60.76	30.16
Lane Group LOS	C	D	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]	1.04	5.32	15.66	15.66	2.61	7.26	7.26	6.10	2.49
50th-Percentile Queue Length [ft/ln]	26.08	132.97	391.52	391.52	65.20	181.44	181.44	152.45	62.25
95th-Percentile Queue Length [veh/ln]	1.88	9.10	22.15	22.15	4.69	11.68	11.68	10.15	4.48
95th-Percentile Queue Length [ft/ln]	46.94	227.53	553.77	553.77	117.36	291.89	291.89	253.70	112.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.36	0.00	36.52	63.70	63.70	33.08	0.00	57.20	57.20	60.76	30.16	0.00
Movement LOS	C		D	E	E	C		E	E	E	C	
d_A, Approach Delay [s/veh]	35.59			60.28			57.20			43.76		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	53.37											
Intersection LOS	D											
Intersection V/C	0.696											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.212	2.433	2.463	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	1350
d_b, Bicycle Delay [s]	54.15	40.84	43.35	6.34
I_b,int, Bicycle LOS Score for Intersection	1.560	3.229	1.947	1.916
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):	10.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.330

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]	174	37	66	502	421	73
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]	174	37	66	502	421	73
Peak Hour Factor	0.8780	0.8780	0.8780	0.8780	0.8780	0.8780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	11	19	143	120	21
Total Analysis Volume [veh/h]	198	42	75	572	479	83
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 in	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	0.12	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]	241	255	1308	2769	1201	1201
d1, Uniform Delay [s]	37.52	33.94	2.51	2.85	5.91	5.91
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.80	0.30	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	0.16	0.06	0.21	0.23	0.23
d, Delay for Lane Group [s/veh]	44.32	34.24	2.59	3.02	6.36	6.36
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.67	0.83	0.20	0.81	1.73	1.73
50th-Percentile Queue Length [ft/ln]	116.75	20.75	5.08	20.33	43.25	43.25
95th-Percentile Queue Length [veh/ln]	8.21	1.49	0.37	1.46	3.11	3.11
95th-Percentile Queue Length [ft/ln]	205.36	37.35	9.14	36.60	77.85	77.85

Movement, Approach, & Intersection Results

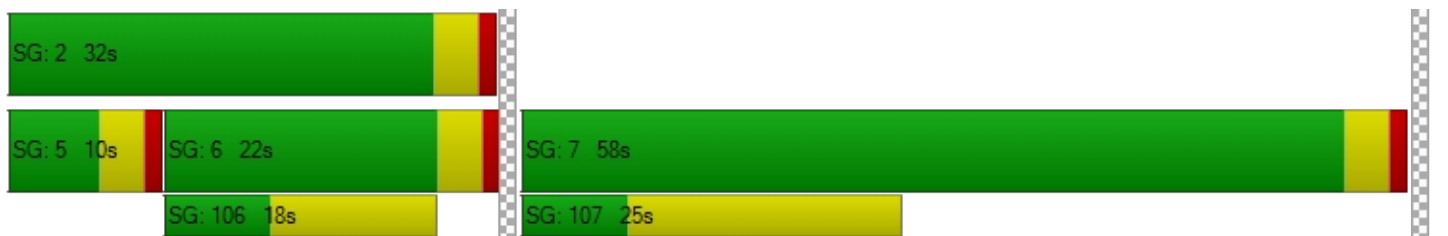
d_M, Delay for Movement [s/veh]	44.32	34.24	2.59	3.02	6.36	6.36
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.56		2.97		6.36	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.84					
Intersection LOS	B					
Intersection V/C	0.330					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.121	2.641	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.093	2.023
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):	38.5
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	+			+			T			T		
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]	37	2	84	2	0	6	10	483	93	118	320	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]	37	2	84	2	0	6	10	483	93	118	320	11
Peak Hour Factor	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820	0.8820
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	1	24	1	0	2	3	137	26	33	91	3
Total Analysis Volume [veh/h]	42	2	95	2	0	7	11	548	105	134	363	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	0.27	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]	36.68	38.46	18.54	26.94	32.15	9.55	8.08	0.00	0.00	9.52	0.00	0.00
Movement LOS	E	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.08	2.08	2.08	0.06	0.06	0.06	0.03	0.00	0.00	0.50	0.00	0.00
95th-Percentile Queue Length [ft/ln]	51.97	51.97	51.97	1.58	1.58	1.58	0.71	0.00	0.00	12.57	0.00	0.00
d_A, Approach Delay [s/veh]	24.31			13.41			0.13			2.51		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	3.68											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.311

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	60	6	17	2	8	33	52	515	153	10	371	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]	60	6	17	2	8	33	52	515	153	10	371	6
Peak Hour Factor	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530	0.8530
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	10	15	151	45	3	109	2
Total Analysis Volume [veh/h]	70	7	20	2	9	39	61	604	179	12	435	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 in	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	0.65	0.65	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	0.23	0.21	0.01	0.12	0.12
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1177	1149	307	467	467	119	467	467
d1, Uniform Delay [s]	5.78	5.62	25.56	31.84	31.15	24.82	28.10	28.08
k, delay calibration	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
d2, Incremental Delay [s]	0.14	0.07	0.31	5.20	3.32	0.36	0.75	0.74
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	0.81	0.10	0.47	0.47
d, Delay for Lane Group [s/veh]	5.92	5.69	25.87	37.04	34.47	25.18	28.85	28.83
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]	0.60	0.30	0.97	8.52	7.52	0.19	3.86	3.85
50th-Percentile Queue Length [ft/ln]	14.95	7.49	24.27	213.05	188.04	4.81	96.61	96.17
95th-Percentile Queue Length [veh/ln]	1.08	0.54	1.75	13.31	12.02	0.35	6.96	6.92
95th-Percentile Queue Length [ft/ln]	26.91	13.48	43.69	332.73	300.49	8.66	173.91	173.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.92	5.92	5.92	5.69	5.69	5.69	25.87	36.21	34.47	25.18	28.84	28.83
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.92			5.69			35.09			28.74		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.12											
Intersection LOS	C											
Intersection V/C	0.311											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.924			1.882			2.805			2.618		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.720			1.642			2.256			1.934		
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):	33.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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		
	34	216	166	41	533	12	2	34	72	897	105	141
Base Volume Input [veh/h]	34	216	166	41	533	12	2	34	72	897	105	141
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]	34	216	166	41	533	12	2	34	72	897	105	141
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
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	56	43	11	138	3	1	9	19	232	27	37
Total Analysis Volume [veh/h]	35	224	172	42	552	12	2	35	75	930	109	146
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 in	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]	20	35	35	10	25	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	53	94	5	53	53	0	9	37	46	46
g / C, Green / Cycle	0.03	0.44	0.79	0.04	0.44	0.44	0.00	0.08	0.31	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.02	0.06	0.10	0.01	0.15	0.01	0.00	0.06	0.29	0.07	0.07
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	1700	1800	3200	1800	1800
c, Capacity [veh/h]	60	1587	1412	123	1599	799	7	139	992	689	689
d1, Uniform Delay [s]	57.04	20.01	3.09	56.23	21.91	18.67	59.60	54.46	40.27	24.59	24.59
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
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
d2, Incremental Delay [s]	8.65	0.19	0.18	1.62	0.59	0.03	19.99	9.70	4.96	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	0.58	0.14	0.12	0.34	0.35	0.02	0.28	0.79	0.94	0.18	0.18
d, Delay for Lane Group [s/veh]	65.69	20.19	3.26	57.85	22.50	18.71	79.59	64.16	45.24	24.72	24.72
Lane Group LOS	E	C	A	E	C	B	E	E	D	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.16	1.81	0.71	0.62	4.85	0.18	0.10	3.59	13.58	2.39	2.39
50th-Percentile Queue Length [ft/ln]	28.97	45.28	17.77	15.62	121.34	4.57	2.49	89.73	339.39	59.72	59.72
95th-Percentile Queue Length [veh/ln]	2.09	3.26	1.28	1.12	8.47	0.33	0.18	6.46	19.62	4.30	4.30
95th-Percentile Queue Length [ft/ln]	52.14	81.50	31.98	28.11	211.67	8.22	4.48	161.51	490.46	107.49	107.49

Movement, Approach, & Intersection Results

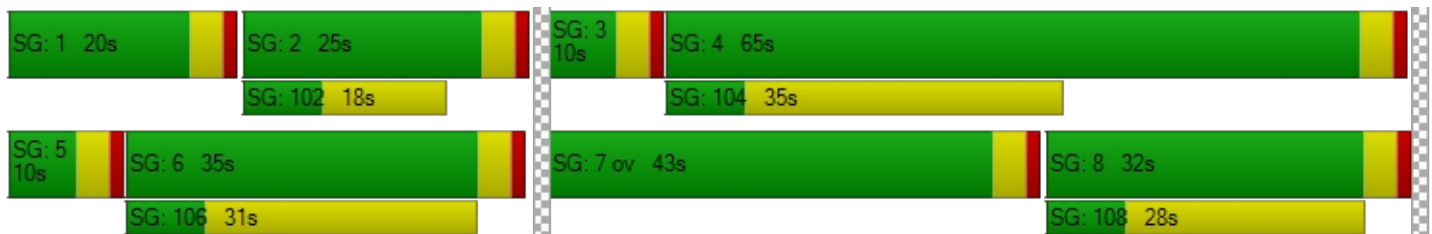
d_M, Delay for Movement [s/veh]	65.69	20.19	3.26	57.85	22.50	18.71	79.59	64.16	64.16	45.24	24.72	24.72
Movement LOS	E	C	A	E	C	B	E	E	E	D	C	C
d_A, Approach Delay [s/veh]	17.13			24.87			64.43			40.82		
Approach LOS	B			C			E			D		
d_I, Intersection Delay [s/veh]	33.44											
Intersection LOS	C											
Intersection V/C	0.607											

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]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersection	3.005	2.857	2.070	2.777
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	350	467	1017
d_b, Bicycle Delay [s]	33.00	40.84	35.27	14.50
I_b,int, Bicycle LOS Score for Intersection	1.915	2.060	1.744	3.515
Bicycle LOS	A	B	A	D

Sequence

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



APPENDIX H-II

**EXISTING WITH PROJECT WITH MITIGATION
TRAFFIC CONDITIONS**

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

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

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	1	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]	51	0	354	243	26	32	0	736	30	221	302	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]	51	0	354	243	26	32	0	736	30	221	302	0
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	1.0000	0.9140	0.9140	0.9140	0.9140	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]	14	0	97	66	7	9	0	201	8	60	83	0
Total Analysis Volume [veh/h]	56	0	387	266	28	35	0	805	33	242	330	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 in	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]	12.00

Phasing & Timing

Control Type	Split	Permiss	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	15	15	0	33	0	0	24	0	18	42	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	L	C
C, Cycle Length [s]	90	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	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	19	59	19	19	19	23	23	39	39
g / C, Green / Cycle	0.22	0.66	0.22	0.22	0.22	0.26	0.26	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.03	0.22	0.07	0.10	0.02	0.22	0.02	0.14	0.09
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	3600	1800	1700	3600
c, Capacity [veh/h]	366	1180	407	440	388	921	460	496	1570
d1, Uniform Delay [s]	28.68	6.81	29.90	30.83	28.28	32.13	25.41	16.70	15.77
k, delay calibration	0.50	0.50	0.50	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]	0.89	0.74	1.92	2.58	0.46	2.80	0.07	0.74	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	0.15	0.33	0.30	0.39	0.09	0.87	0.07	0.49	0.21
d, Delay for Lane Group [s/veh]	29.56	7.56	31.82	33.40	28.74	34.93	25.48	17.45	15.84
Lane Group LOS	C	A	C	C	C	C	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.05	2.96	2.41	3.45	0.64	8.16	0.51	3.08	1.93
50th-Percentile Queue Length [ft/ln]	26.14	73.90	60.27	86.13	15.97	204.09	12.86	77.10	48.34
95th-Percentile Queue Length [veh/ln]	1.88	5.32	4.34	6.20	1.15	12.85	0.93	5.55	3.48
95th-Percentile Queue Length [ft/ln]	47.06	133.01	108.49	155.03	28.74	321.23	23.15	138.77	87.02

Movement, Approach, & Intersection Results

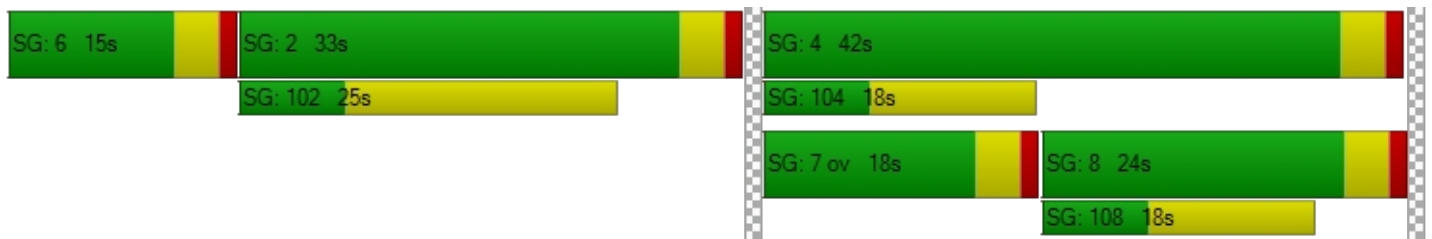
d_M, Delay for Movement [s/veh]	29.56	0.00	7.56	32.65	33.40	28.74	0.00	34.93	25.48	17.45	15.84	0.00
Movement LOS	C		A	C	C	C		C	C	B	B	
d_A, Approach Delay [s/veh]	10.34			32.31			34.56			16.52		
Approach LOS	B			C			C			B		
d_I, Intersection Delay [s/veh]	24.57											
Intersection LOS	C											
Intersection V/C	0.701											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	34.67	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.318	2.224	2.668	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]	244	644	444	844
d_b, Bicycle Delay [s]	34.67	20.67	27.22	15.02
I_b,int, Bicycle LOS Score for Intersection	1.560	2.102	2.251	2.032
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 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	44.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.560

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	1	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]	43	0	196	704	119	103	0	341	89	176	220	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]	43	0	196	704	119	103	0	341	89	176	220	0
Peak Hour Factor	0.9150	0.9150	0.9150	0.9150	0.9150	0.9150	1.0000	0.9150	0.9150	0.9150	0.9150	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]	12	0	54	192	33	28	0	93	24	48	60	0
Total Analysis Volume [veh/h]	47	0	214	769	130	113	0	373	97	192	240	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 in	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	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	10	10	0	29	0	0	22	0	59	81	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	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	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	37	75	37	37	37	15	15	33	33
g / C, Green / Cycle	0.31	0.62	0.31	0.31	0.31	0.13	0.13	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.26	0.26	0.06	0.10	0.05	0.11	0.07
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	3600	1800	1700	3600
c, Capacity [veh/h]	530	1119	530	530	561	455	227	391	995
d1, Uniform Delay [s]	29.25	9.76	38.67	38.67	30.35	51.14	48.45	35.45	33.70
k, delay calibration	0.50	0.50	0.50	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]	0.33	0.38	15.44	15.44	0.81	3.72	1.27	0.96	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	0.09	0.19	0.85	0.85	0.20	0.82	0.43	0.49	0.24
d, Delay for Lane Group [s/veh]	29.58	10.14	54.10	54.10	31.15	54.86	49.72	36.41	33.82
Lane Group LOS	C	B	D	D	C	D	D	D	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.01	2.43	14.39	14.39	2.52	5.56	2.70	4.56	2.66
50th-Percentile Queue Length [ft/ln]	25.18	60.76	359.80	359.80	62.92	138.96	67.58	113.99	66.60
95th-Percentile Queue Length [veh/ln]	1.81	4.37	20.61	20.61	4.53	9.42	4.87	8.06	4.80
95th-Percentile Queue Length [ft/ln]	45.32	109.37	515.34	515.34	113.25	235.62	121.64	201.54	119.88

Movement, Approach, & Intersection Results

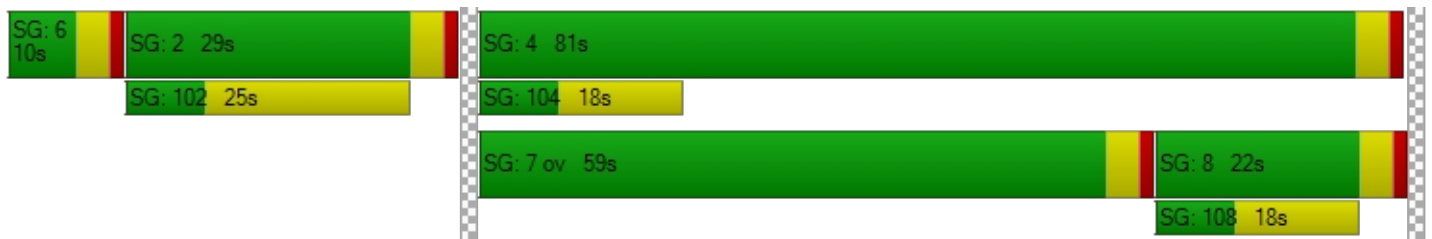
d_M, Delay for Movement [s/veh]	29.58	0.00	10.14	54.10	54.10	31.15	0.00	54.86	49.72	36.41	33.82	0.00
Movement LOS	C		B	D	D	C		D	D	D	C	
d_A, Approach Delay [s/veh]	13.64			51.54			53.80			34.97		
Approach LOS	B			D			D			C		
d_I, Intersection Delay [s/veh]	44.19											
Intersection LOS	D											
Intersection V/C	0.560											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.251	2.433	2.568	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	417	300	1283
d_b, Bicycle Delay [s]	54.15	37.60	43.35	7.70
I_b,int, Bicycle LOS Score for Intersection	1.560	3.229	1.947	1.916
Bicycle LOS	A	C	A	A

Sequence

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



APPENDIX H-III

YEAR 2024 WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.1
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.177

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	104	0	29	44	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	104	0	29	44	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	27	0	8	12	18	18	3	0	0	2	22
Total Analysis Volume [veh/h]	2	109	0	31	46	74	74	12	0	0	6	86
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	797	852	750	883
Degree of Utilization, x	0.14	0.18	0.11	0.10

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.48	0.64	0.39	0.35
95th-Percentile Queue Length [ft]	12.07	16.03	9.68	8.69
Approach Delay [s/veh]	8.25	8.13	8.43	7.55
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.10			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	61.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.771

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]	57	0	371	258	27	34	0	800	34	233	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]	57	0	371	258	27	34	0	800	34	233	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]	15	0	98	68	7	9	0	211	9	61	88	0
Total Analysis Volume [veh/h]	60	0	391	272	28	36	0	842	36	245	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 in	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]	29	29	0	0	25	0	0	32	0	34	66	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	
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	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]	27	27	27	27	27	30	30	19	53
g / C, Green / Cycle	0.23	0.23	0.23	0.23	0.23	0.25	0.25	0.16	0.44
(v / s)_i Volume / Saturation Flow Rate	0.04	0.22	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]	387	410	387	387	410	450	450	275	1602
d1, Uniform Delay [s]	37.15	45.78	39.29	39.32	36.57	44.71	44.71	49.28	20.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.43	0.43	0.14	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]	0.85	34.42	2.90	2.94	0.42	34.15	34.15	11.93	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	0.16	0.95	0.39	0.39	0.09	0.98	0.98	0.89	0.22
d, Delay for Lane Group [s/veh]	38.00	80.21	42.19	42.26	36.99	78.87	78.87	61.21	20.57
Lane Group LOS	D	F	D	D	D	E	E	E	C
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.50	15.23	4.02	4.06	0.88	16.72	16.72	7.90	2.93
50th-Percentile Queue Length [ft/ln]	37.51	380.74	100.52	101.45	22.00	418.00	418.00	197.39	73.29
95th-Percentile Queue Length [veh/ln]	2.70	21.63	7.24	7.30	1.58	23.43	23.43	12.50	5.28
95th-Percentile Queue Length [ft/ln]	67.51	540.74	180.94	182.61	39.61	585.65	585.65	312.59	131.93

Movement, Approach, & Intersection Results

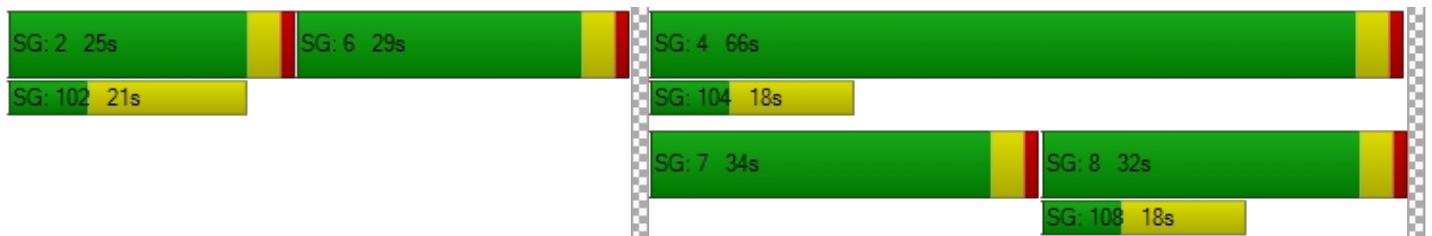
d_M, Delay for Movement [s/veh]	38.00	0.00	80.21	42.22	42.26	36.99	0.00	78.87	78.87	61.21	20.57	0.00
Movement LOS	D		F	D	D	D		E	E	E	C	
d_A, Approach Delay [s/veh]	74.59			41.66			78.87			37.25		
Approach LOS	E			D			E			D		
d_I, Intersection Delay [s/veh]	61.51											
Intersection LOS	E											
Intersection V/C	0.771											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.242	2.240	2.630	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]	417	350	467	1033
d_b, Bicycle Delay [s]	37.60	40.84	35.27	14.02
I_b,int, Bicycle LOS Score for Intersection	1.560	2.114	2.284	2.052
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):	15.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.355

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	458	332	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	458	332	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	121	87	13
Total Analysis Volume [veh/h]	295	48	56	482	349	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 in	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	1234	2560	1108	1108
d1, Uniform Delay [s]	34.87	29.60	3.88	4.34	7.50	7.50
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, 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	0.36	0.36
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	0.18	0.18
d, Delay for Lane Group [s/veh]	41.60	29.77	3.95	4.50	7.86	7.86
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	1.48	1.48
50th-Percentile Queue Length [ft/ln]	170.74	21.81	5.88	26.87	36.91	36.91
95th-Percentile Queue Length [veh/ln]	11.12	1.57	0.42	1.93	2.66	2.66
95th-Percentile Queue Length [ft/ln]	277.89	39.25	10.59	48.36	66.44	66.44

Movement, Approach, & Intersection Results

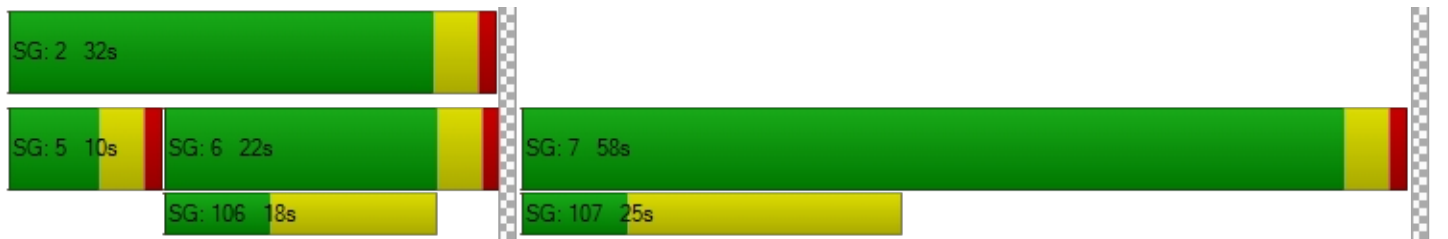
d_M, Delay for Movement [s/veh]	41.60	29.77	3.95	4.50	7.86	7.86
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.95		4.44		7.86	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	15.00					
Intersection LOS	B					
Intersection V/C	0.355					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.113	2.573	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.003	1.891
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):	19.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.136

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	41	0	176	7	0	8	8	308	42	72	311	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]	41	0	176	7	0	8	8	308	42	72	311	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]	11	0	46	2	0	2	2	81	11	19	82	3
Total Analysis Volume [veh/h]	43	0	185	7	0	8	8	324	44	76	327	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	0.22	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]	19.50	21.28	12.50	19.48	18.76	9.60	7.98	0.00	0.00	8.24	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.63	1.63	1.63	0.11	0.11	0.11	0.02	0.00	0.00	0.20	0.00	0.00
95th-Percentile Queue Length [ft/ln]	40.75	40.75	40.75	2.87	2.87	2.87	0.50	0.00	0.00	5.12	0.00	0.00
d_A, Approach Delay [s/veh]	13.82			14.21			0.17			1.51		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	3.92											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.159

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	328	44	7	321	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	328	44	7	321	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	86	12	2	84	2
Total Analysis Volume [veh/h]	57	0	2	5	0	41	25	345	46	7	338	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 in	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]	69	69	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	0.10	0.10
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1392	1358	130	249	249	105	249	249
d1, Uniform Delay [s]	2.41	2.39	33.84	37.47	37.34	33.48	36.89	36.87
k, delay calibration	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
d2, Incremental Delay [s]	0.06	0.05	0.71	5.73	5.09	0.26	3.46	3.41
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	0.80	0.77	0.07	0.69	0.69
d, Delay for Lane Group [s/veh]	2.46	2.43	34.55	43.20	42.44	33.75	40.34	40.28
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]	0.17	0.13	0.48	4.40	4.23	0.13	3.67	3.65
50th-Percentile Queue Length [ft/ln]	4.13	3.21	12.03	109.90	105.71	3.35	91.81	91.33
95th-Percentile Queue Length [veh/ln]	0.30	0.23	0.87	7.83	7.60	0.24	6.61	6.58
95th-Percentile Queue Length [ft/ln]	7.44	5.77	21.65	195.86	190.02	6.02	165.26	164.39

Movement, Approach, & Intersection Results

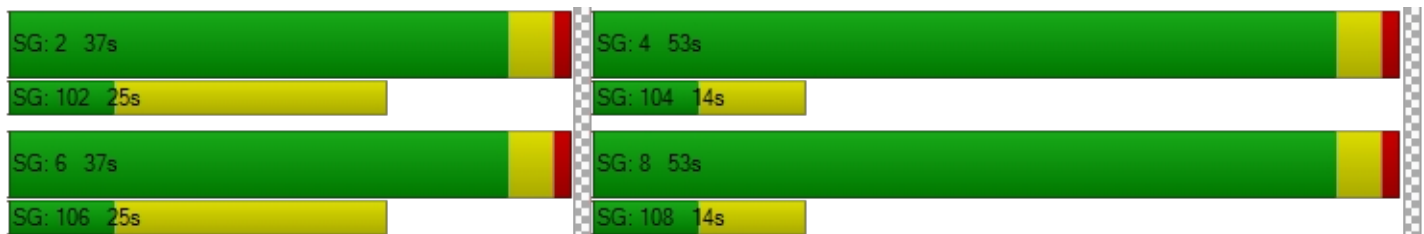
d_M, Delay for Movement [s/veh]	2.46	2.46	2.46	2.43	2.43	2.43	34.55	42.88	42.44	33.75	40.31	40.28
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.46			2.43			42.33			40.18		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.67											
Intersection LOS	D											
Intersection V/C	0.159											

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]	34.67			34.67			34.67			34.67		
l_p,int, Pedestrian LOS Score for Intersection	1.797			1.801			2.630			2.512		
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]	733			733			1089			1089		
d_b, Bicycle Delay [s]	18.05			18.05			9.34			9.34		
l_b,int, Bicycle LOS Score for Intersection	1.657			1.636			1.903			1.850		
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):	18.0
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	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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	497	420	87	393	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	497	420	87	393	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	131	111	23	103	22	15	17	10	38	10	16
Total Analysis Volume [veh/h]	34	523	442	92	414	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 in	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	0.15	0.25	0.03	0.12	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	7.62	4.40	43.41	6.59	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
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
d2, Incremental Delay [s]	6.15	0.24	0.68	1.98	0.17	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	0.23	0.33	0.49	0.18	0.08	0.69	0.76	0.75	0.32	0.29
d, Delay for Lane Group [s/veh]	51.02	7.86	5.07	45.39	6.76	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	1.89	2.10	1.04	1.27	0.53	1.60	2.76	1.89	1.19	1.08
50th-Percentile Queue Length [ft/ln]	21.56	47.34	52.44	25.98	31.68	13.17	40.09	69.02	47.16	29.73	26.93
95th-Percentile Queue Length [veh/ln]	1.55	3.41	3.78	1.87	2.28	0.95	2.89	4.97	3.40	2.14	1.94
95th-Percentile Queue Length [ft/ln]	38.80	85.22	94.40	46.77	57.02	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	7.86	5.07	45.39	6.76	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]	8.10			12.66			52.08			46.16		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	17.96											
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 [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]	37.14	37.14	37.14	37.14
I_p,int, Pedestrian LOS Score for Intersection	2.890	2.913	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]	653	379	758	737
d_b, Bicycle Delay [s]	21.56	31.21	18.32	18.95
I_b,int, Bicycle LOS Score for Intersection	2.384	2.050	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):	8.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.247

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	72	1	47	120	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	72	1	47	120	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	19	0	12	32	9	10	4	2	0	1	12
Total Analysis Volume [veh/h]	1	76	1	49	126	35	40	16	6	0	3	49
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	815	851	765	880
Degree of Utilization, x	0.10	0.25	0.08	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	0.97	0.26	0.19
95th-Percentile Queue Length [ft]	7.91	24.30	6.60	4.70
Approach Delay [s/veh]	7.88	8.62	8.13	7.35
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.23			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	56.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

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]	48	0	205	746	124	109	0	383	97	184	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]	48	0	205	746	124	109	0	383	97	184	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]	13	0	54	196	33	29	0	101	26	48	68	0
Total Analysis Volume [veh/h]	51	0	216	785	131	115	0	403	102	194	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 in	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]	23	23	0	0	47	0	0	27	0	23	50	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	
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	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]	34	34	34	34	34	19	19	16	39
g / C, Green / Cycle	0.29	0.29	0.29	0.29	0.29	0.16	0.16	0.13	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.27	0.27	0.06	0.14	0.14	0.11	0.08
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	1800	1800	1700	3600
c, Capacity [veh/h]	487	515	487	487	515	292	292	225	1179
d1, Uniform Delay [s]	31.54	34.77	41.88	41.88	32.69	49.04	49.04	51.07	29.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.13	0.13	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]	0.43	2.50	28.49	28.49	1.00	8.87	8.87	9.52	0.10
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	0.10	0.42	0.94	0.94	0.22	0.86	0.86	0.86	0.23
d, Delay for Lane Group [s/veh]	31.98	37.27	70.38	70.38	33.69	57.90	57.90	60.60	29.49
Lane Group LOS	C	D	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]	1.15	5.43	16.82	16.82	2.68	7.88	7.88	6.16	2.82
50th-Percentile Queue Length [ft/ln]	28.65	135.84	420.42	420.42	67.10	197.05	197.05	153.88	70.42
95th-Percentile Queue Length [veh/ln]	2.06	9.26	23.54	23.54	4.83	12.49	12.49	10.22	5.07
95th-Percentile Queue Length [ft/ln]	51.56	231.42	588.55	588.55	120.78	312.15	312.15	255.60	126.76

Movement, Approach, & Intersection Results

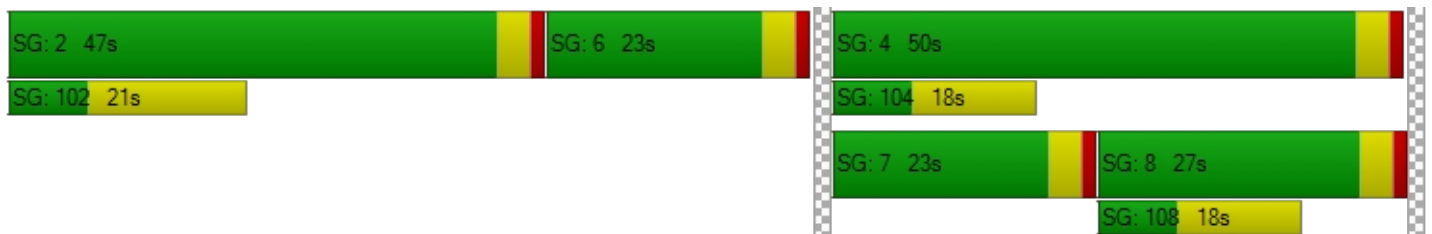
d_M, Delay for Movement [s/veh]	31.98	0.00	37.27	70.38	70.38	33.69	0.00	57.90	57.90	60.60	29.49	0.00
Movement LOS	C		D	E	E	C		E	E	E	C	
d_A, Approach Delay [s/veh]	36.26			66.28			57.90			42.39		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	55.97											
Intersection LOS	E											
Intersection V/C	0.715											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.217	2.438	2.490	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]	317	717	383	767
d_b, Bicycle Delay [s]	42.50	24.70	39.20	22.82
I_b,int, Bicycle LOS Score for Intersection	1.560	3.261	1.976	1.946
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):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.334

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	557	477	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	557	477	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	147	126	20
Total Analysis Volume [veh/h]	194	42	75	586	502	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 in	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	1308	2778	1205	1205
d1, Uniform Delay [s]	37.63	34.13	2.46	2.80	5.86	5.86
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, 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	0.48	0.48
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	0.21	0.24	0.24
d, Delay for Lane Group [s/veh]	44.43	34.44	2.54	2.98	6.34	6.34
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	0.82	1.79	1.79
50th-Percentile Queue Length [ft/ln]	114.49	20.82	4.96	20.40	44.65	44.65
95th-Percentile Queue Length [veh/ln]	8.09	1.50	0.36	1.47	3.21	3.21
95th-Percentile Queue Length [ft/ln]	202.23	37.48	8.93	36.71	80.37	80.37

Movement, Approach, & Intersection Results

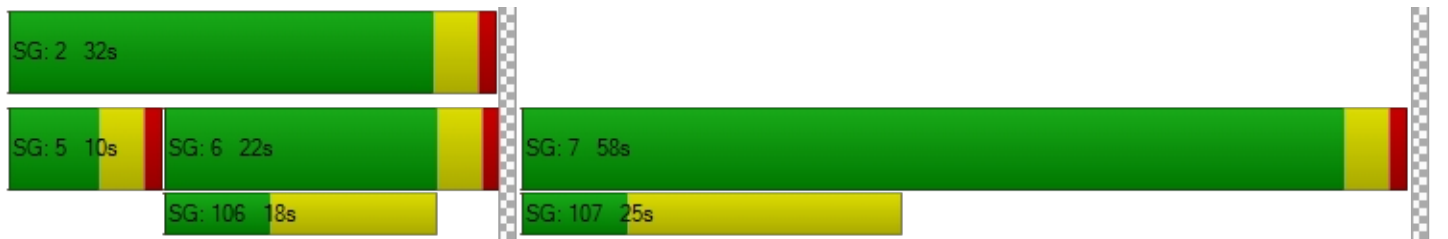
d_M, Delay for Movement [s/veh]	44.43	34.44	2.54	2.98	6.34	6.34
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.66		2.93		6.34	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.61					
Intersection LOS	B					
Intersection V/C	0.334					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.120	2.652	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.105	2.041
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):	41.8
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

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]	42	2	89	2	0	7	12	537	103	125	370	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]	42	2	89	2	0	7	12	537	103	125	370	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]	11	1	23	1	0	2	3	141	27	33	97	3
Total Analysis Volume [veh/h]	44	2	94	2	0	7	13	565	108	132	389	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	0.30	0.02	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]	39.61	41.77	20.22	28.35	34.04	9.65	8.16	0.00	0.00	9.60	0.00	0.00
Movement LOS	E	E	C	D	D	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.31	2.31	2.31	0.07	0.07	0.07	0.03	0.00	0.00	0.50	0.00	0.00
95th-Percentile Queue Length [ft/ln]	57.71	57.71	57.71	1.65	1.65	1.65	0.85	0.00	0.00	12.60	0.00	0.00
d_A, Approach Delay [s/veh]	26.63			13.81			0.15			2.37		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	3.82											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.309

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	576	166	11	429	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	576	166	11	429	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	152	44	3	113	2
Total Analysis Volume [veh/h]	71	6	19	2	8	38	60	606	175	12	452	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 in	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	0.65	0.65	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	0.23	0.21	0.01	0.13	0.13
s, saturation flow rate [veh/h]	1700	1700	1700	1800	1800	1700	1800	1800
c, Capacity [veh/h]	1179	1151	298	465	465	119	465	465
d1, Uniform Delay [s]	5.75	5.58	25.60	31.88	31.20	24.87	28.30	28.29
k, delay calibration	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
d2, Incremental Delay [s]	0.14	0.07	0.33	5.21	3.36	0.36	0.81	0.80
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	0.81	0.10	0.49	0.49
d, Delay for Lane Group [s/veh]	5.89	5.65	25.93	37.09	34.56	25.23	29.11	29.09
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]	0.59	0.29	0.96	8.50	7.52	0.19	4.03	4.02
50th-Percentile Queue Length [ft/ln]	14.73	7.16	23.91	212.43	187.97	4.82	100.81	100.41
95th-Percentile Queue Length [veh/ln]	1.06	0.52	1.72	13.28	12.02	0.35	7.26	7.23
95th-Percentile Queue Length [ft/ln]	26.51	12.88	43.04	331.95	300.40	8.67	181.45	180.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.89	5.89	5.89	5.65	5.65	5.65	25.93	36.25	34.56	25.23	29.10	29.09
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.89			5.65			35.16			29.00		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.27											
Intersection LOS	C											
Intersection V/C	0.309											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.921			1.878			2.810			2.623		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.718			1.639			2.253			1.947		
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):	59.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.741

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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	280	328	51	618	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	280	328	51	618	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	74	86	13	163	3	1	9	20	299	29	41
Total Analysis Volume [veh/h]	38	295	345	54	651	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 in	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	22.16	3.74	55.97	24.35	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
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
d2, Incremental Delay [s]	9.15	0.29	0.42	1.86	0.88	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	0.20	0.25	0.40	0.43	0.02	0.28	0.80	1.15	0.19	0.19
d, Delay for Lane Group [s/veh]	66.12	22.45	4.16	57.83	25.22	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	2.57	1.73	0.80	6.22	0.22	0.10	3.84	25.06	2.55	2.55
50th-Percentile Queue Length [ft/ln]	31.51	64.20	43.23	20.05	155.47	5.59	2.49	95.93	626.50	63.82	63.82
95th-Percentile Queue Length [veh/ln]	2.27	4.62	3.11	1.44	10.31	0.40	0.18	6.91	36.32	4.60	4.60
95th-Percentile Queue Length [ft/ln]	56.72	115.57	77.81	36.08	257.71	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	22.45	4.16	57.83	25.22	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]	15.59			27.57			63.98			95.26		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	59.70											
Intersection LOS	E											
Intersection V/C	0.741											

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]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersection	3.172	2.909	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	1017
d_b, Bicycle Delay [s]	33.00	42.50	35.27	14.50
I_b,int, Bicycle LOS Score for Intersection	2.119	2.153	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX H-IV

**YEAR 2024 WITH PROJECT WITH MITIGATION
TRAFFIC CONDITIONS**

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

Control Type:	Signalized	Delay (sec / veh):	24.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.711

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	1	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]	57	0	371	258	27	34	0	800	34	233	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]	57	0	371	258	27	34	0	800	34	233	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]	15	0	98	68	7	9	0	211	9	61	88	0
Total Analysis Volume [veh/h]	60	0	391	272	28	36	0	842	36	245	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 in	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]	12.00

Phasing & Timing

Control Type	Split	Permiss	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	11	11	0	29	0	0	30	0	20	50	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	L	C
C, Cycle Length [s]	90	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	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	19	58	19	19	19	24	24	40	40
g / C, Green / Cycle	0.21	0.65	0.21	0.21	0.21	0.27	0.27	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.04	0.22	0.08	0.10	0.02	0.23	0.02	0.14	0.10
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	3600	1800	1700	3600
c, Capacity [veh/h]	354	1162	395	427	375	957	479	504	1621
d1, Uniform Delay [s]	29.27	7.24	30.64	31.30	28.81	31.69	24.77	15.90	15.09
k, delay calibration	0.50	0.50	0.50	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]	1.03	0.78	2.30	2.67	0.51	2.82	0.07	0.73	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	0.17	0.34	0.34	0.39	0.10	0.88	0.08	0.49	0.22
d, Delay for Lane Group [s/veh]	30.31	8.02	32.94	33.97	29.32	34.51	24.84	16.63	15.15
Lane Group LOS	C	A	C	C	C	C	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.14	3.13	2.67	3.40	0.67	8.51	0.55	3.02	2.01
50th-Percentile Queue Length [ft/ln]	28.48	78.18	66.73	84.90	16.65	212.77	13.82	75.60	50.16
95th-Percentile Queue Length [veh/ln]	2.05	5.63	4.80	6.11	1.20	13.30	0.99	5.44	3.61
95th-Percentile Queue Length [ft/ln]	51.27	140.72	120.11	152.81	29.96	332.39	24.87	136.08	90.29

Movement, Approach, & Intersection Results

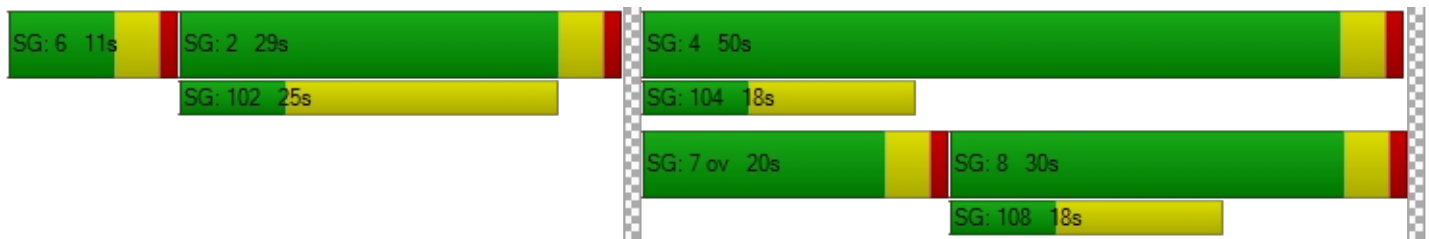
d_M, Delay for Movement [s/veh]	30.31	0.00	8.02	33.46	33.97	29.32	0.00	34.51	24.84	16.63	15.15	0.00
Movement LOS	C		A	C	C	C		C	C	B	B	
d_A, Approach Delay [s/veh]	10.99			33.06			34.11			15.76		
Approach LOS	B			C			C			B		
d_I, Intersection Delay [s/veh]	24.50											
Intersection LOS	C											
Intersection V/C	0.711											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	34.67	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.328	2.226	2.687	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]	156	556	578	1022
d_b, Bicycle Delay [s]	38.27	23.47	22.76	10.76
I_b,int, Bicycle LOS Score for Intersection	1.560	2.114	2.284	2.052
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 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	45.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

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	1	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]	48	0	205	746	124	109	0	383	97	184	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]	48	0	205	746	124	109	0	383	97	184	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]	13	0	54	196	33	29	0	101	26	48	68	0
Total Analysis Volume [veh/h]	51	0	216	785	131	115	0	403	102	194	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 in	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	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	10	10	0	29	0	0	27	0	54	81	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	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	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	37	75	37	37	37	16	16	34	34
g / C, Green / Cycle	0.31	0.63	0.31	0.31	0.31	0.13	0.13	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.27	0.27	0.06	0.11	0.06	0.11	0.08
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1800	3600	1800	1700	3600
c, Capacity [veh/h]	523	1127	523	523	554	486	243	392	1026
d1, Uniform Delay [s]	29.69	9.55	39.42	39.42	30.77	50.61	47.64	34.65	33.23
k, delay calibration	0.50	0.50	0.50	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]	0.37	0.38	18.32	18.32	0.85	3.71	1.15	0.97	0.14
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	0.10	0.19	0.88	0.88	0.21	0.83	0.42	0.49	0.27
d, Delay for Lane Group [s/veh]	30.06	9.93	57.75	57.75	31.62	54.32	48.80	35.62	33.37
Lane Group LOS	C	A	E	E	C	D	D	D	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.10	2.42	15.18	15.18	2.58	5.99	2.81	4.55	3.03
50th-Percentile Queue Length [ft/ln]	27.61	60.49	379.59	379.59	64.62	149.77	70.33	113.75	75.73
95th-Percentile Queue Length [veh/ln]	1.99	4.36	21.57	21.57	4.65	10.00	5.06	8.05	5.45
95th-Percentile Queue Length [ft/ln]	49.69	108.89	539.36	539.36	116.32	250.12	126.60	201.21	136.32

Movement, Approach, & Intersection Results

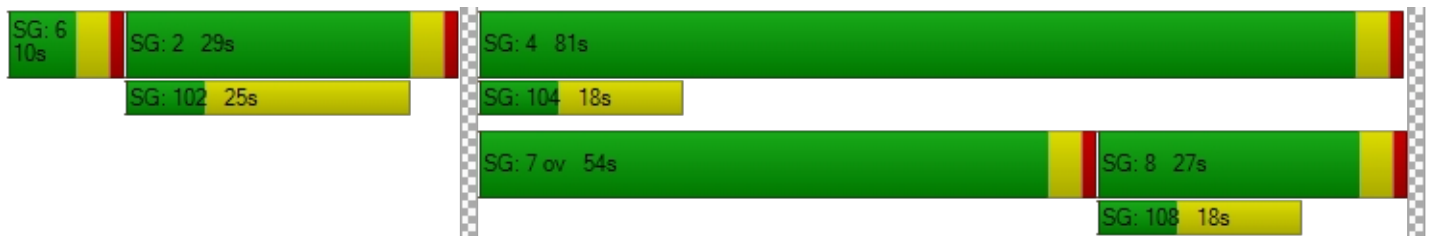
d_M, Delay for Movement [s/veh]	30.06	0.00	9.93	57.75	57.75	31.62	0.00	54.32	48.80	35.62	33.37	0.00
Movement LOS	C		A	E	E	C		D	D	D	C	
d_A, Approach Delay [s/veh]	13.78			54.83			53.21			34.30		
Approach LOS	B			D			D			C		
d_I, Intersection Delay [s/veh]	45.41											
Intersection LOS	D											
Intersection V/C	0.575											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.259	2.438	2.590	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	417	383	1283
d_b, Bicycle Delay [s]	54.15	37.60	39.20	7.70
I_b,int, Bicycle LOS Score for Intersection	1.560	3.261	1.976	1.946
Bicycle LOS	A	C	A	A

Sequence

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



APPENDIX H-V

YEAR 2040 WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report

Intersection 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.185

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	105	0	30	45	74	74	12	0	0	6	86
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	105	0	30	45	74	74	12	0	0	6	86
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	28	0	8	12	19	19	3	0	0	2	23
Total Analysis Volume [veh/h]	2	111	0	32	47	78	78	13	0	0	6	91
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	791	848	745	878
Degree of Utilization, x	0.14	0.19	0.12	0.11

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.50	0.68	0.42	0.37
95th-Percentile Queue Length [ft]	12.43	16.93	10.38	9.29
Approach Delay [s/veh]	8.31	8.21	8.50	7.61
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.17			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	74.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.834

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]	59	0	433	300	28	36	0	913	35	260	446	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]	59	0	433	300	28	36	0	913	35	260	446	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]	16	0	114	79	7	9	0	240	9	68	117	0
Total Analysis Volume [veh/h]	62	0	456	316	29	38	0	961	37	274	469	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 in	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]	36	36	0	0	25	0	0	26	0	33	59	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]	27	27	27	27	27	30	30	20	54
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.22	0.25	0.25	0.17	0.45
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.10	0.10	0.02	0.26	0.26	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1900	1900	1800	3800
c, Capacity [veh/h]	402	425	402	402	425	474	474	306	1721
d1, Uniform Delay [s]	37.48	46.61	40.01	40.04	36.93	45.04	45.04	48.79	20.50
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.16	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]	0.81	64.72	3.29	3.34	0.42	55.11	55.11	13.00	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
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	0.15	1.07	0.43	0.43	0.09	1.05	1.05	0.90	0.27
d, Delay for Lane Group [s/veh]	38.29	111.33	43.30	43.38	37.34	100.15	100.15	61.79	20.58
Lane Group LOS	D	F	D	D	D	F	F	E	C
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.55	20.10	4.70	4.74	0.93	20.83	20.83	8.90	3.95
50th-Percentile Queue Length [ft/ln]	38.84	502.42	117.38	118.42	23.31	520.63	520.63	222.48	98.66
95th-Percentile Queue Length [veh/ln]	2.80	28.58	8.25	8.31	1.68	29.18	29.18	13.79	7.10
95th-Percentile Queue Length [ft/ln]	69.90	714.54	206.22	207.65	41.95	729.60	729.60	344.79	177.59

Movement, Approach, & Intersection Results

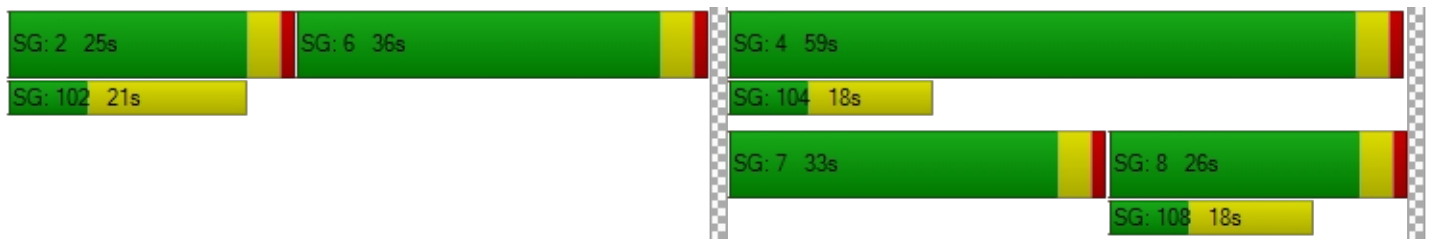
d_M, Delay for Movement [s/veh]	38.29	0.00	111.33	43.34	43.38	37.34	0.00	100.15	100.15	61.79	20.58	0.00
Movement LOS	D		F	D	D	D		F	F	E	C	
d_A, Approach Delay [s/veh]	102.59			42.74			100.15			35.78		
Approach LOS	F			D			F			D		
d_I, Intersection Delay [s/veh]	74.20											
Intersection LOS	E											
Intersection V/C	0.834											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.279	2.254	2.718	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]	533	350	367	917
d_b, Bicycle Delay [s]	32.27	40.84	40.02	17.60
I_b,int, Bicycle LOS Score for Intersection	1.560	2.192	2.383	2.173
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):	14.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.348

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]	294	48	56	470	371	53
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]	294	48	56	470	371	53
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]	77	13	15	124	98	14
Total Analysis Volume [veh/h]	309	51	59	495	391	56
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 in	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	0.12	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	3800	1900	1900
c, Capacity [veh/h]	358	377	1299	2708	1170	1170
d1, Uniform Delay [s]	34.91	29.71	3.85	4.28	7.54	7.54
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.28	0.16	0.07	0.15	0.36	0.36
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	0.86	0.14	0.05	0.18	0.19	0.19
d, Delay for Lane Group [s/veh]	41.18	29.87	3.91	4.43	7.91	7.91
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.11	0.93	0.24	1.09	1.65	1.65
50th-Percentile Queue Length [ft/ln]	177.72	23.20	6.12	27.15	41.14	41.14
95th-Percentile Queue Length [veh/ln]	11.48	1.67	0.44	1.95	2.96	2.96
95th-Percentile Queue Length [ft/ln]	287.04	41.76	11.01	48.87	74.06	74.06

Movement, Approach, & Intersection Results

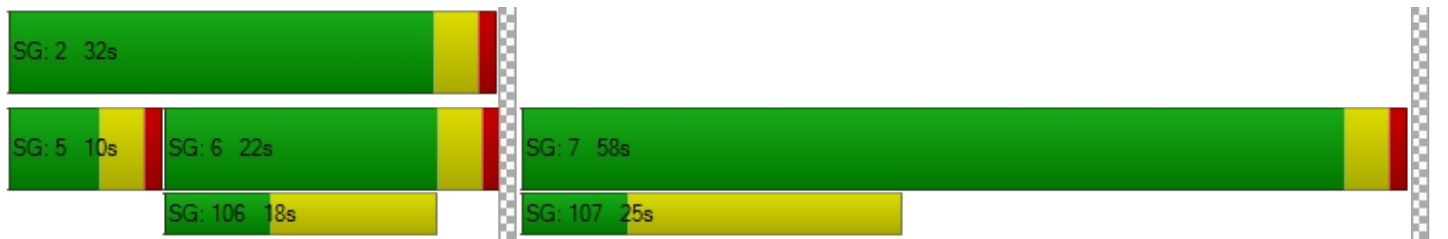
d_M, Delay for Movement [s/veh]	41.18	29.87	3.91	4.43	7.91	7.91
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	39.58		4.37		7.91	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	14.85					
Intersection LOS	B					
Intersection V/C	0.348					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.122	2.591	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.017	1.928
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):	21.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.031

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T			T		
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]	43	0	185	7	0	8	8	328	44	76	351	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]	43	0	185	7	0	8	8	328	44	76	351	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]	11	0	49	2	0	2	2	86	12	20	92	3
Total Analysis Volume [veh/h]	45	0	195	7	0	8	8	345	46	80	369	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	0.16	0.00	0.24	0.03	0.00	0.01	0.01	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	21.22	23.38	13.24	21.46	20.31	9.82	8.09	0.00	0.00	8.32	0.00	0.00
Movement LOS	C	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	1.88	1.88	1.88	0.13	0.13	0.13	0.02	0.00	0.00	0.22	0.00	0.00
95th-Percentile Queue Length [ft/ln]	47.03	47.03	47.03	3.19	3.19	3.19	0.51	0.00	0.00	5.53	0.00	0.00
d_A, Approach Delay [s/veh]	14.74			15.25			0.16			1.44		
Approach LOS	B			C			A			A		
d_I, Intersection Delay [s/veh]	4.03											
Intersection LOS	C											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	36.9
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.157

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	57	0	2	5	0	41	25	341	46	7	357	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]	57	0	2	5	0	41	25	341	46	7	357	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]	15	0	1	1	0	11	7	90	12	2	94	2
Total Analysis Volume [veh/h]	60	0	2	5	0	43	26	359	48	7	376	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 in	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	38	0	0	38	0	0	52	0	0	52	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	0.10	0.10
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800	1900	1900
c, Capacity [veh/h]	1471	1437	122	261	261	108	261	261
d1, Uniform Delay [s]	2.38	2.36	33.92	37.50	37.37	33.56	37.18	37.17
k, delay calibration	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
d2, Incremental Delay [s]	0.05	0.04	0.86	5.35	4.74	0.25	4.01	3.95
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	0.21	0.79	0.77	0.07	0.74	0.73
d, Delay for Lane Group [s/veh]	2.44	2.41	34.78	42.85	42.11	33.81	41.19	41.12
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]	0.17	0.13	0.50	4.55	4.38	0.13	4.13	4.11
50th-Percentile Queue Length [ft/ln]	4.27	3.29	12.59	113.80	109.39	3.35	103.22	102.67
95th-Percentile Queue Length [veh/ln]	0.31	0.24	0.91	8.05	7.81	0.24	7.43	7.39
95th-Percentile Queue Length [ft/ln]	7.68	5.91	22.66	201.27	195.16	6.02	185.80	184.81

Movement, Approach, & Intersection Results

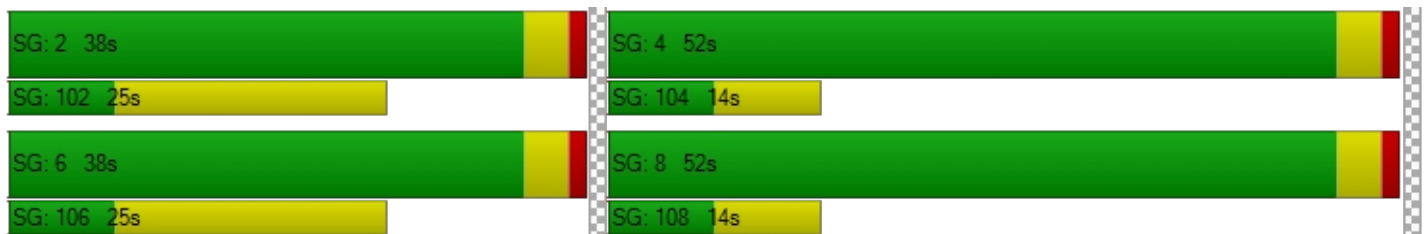
d_M, Delay for Movement [s/veh]	2.44	2.44	2.44	2.41	2.41	2.41	34.78	42.54	42.11	33.81	41.16	41.12
Movement LOS	A	A	A	A	A	A	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	2.44			2.41			42.02			41.03		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	36.94											
Intersection LOS	D											
Intersection V/C	0.157											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.800			1.804			2.651			2.528		
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]	756			756			1067			1067		
d_b, Bicycle Delay [s]	17.42			17.42			9.80			9.80		
I_b,int, Bicycle LOS Score for Intersection	1.662			1.639			1.917			1.881		
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):	22.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	34	618	441	115	398	95	102	69	40	153	40	222
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]	34	618	441	115	398	95	102	69	40	153	40	222
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	163	116	30	105	25	27	18	11	40	11	58
Total Analysis Volume [veh/h]	36	651	464	121	419	100	107	73	42	161	42	234
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 in	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]	105
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	21	32	0	28	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]	105	105	105	105	105	105	105	105	105	105	105
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	63	79	6	65	65	8	8	12	12	12
g / C, Green / Cycle	0.04	0.60	0.75	0.06	0.62	0.62	0.08	0.08	0.11	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.02	0.17	0.24	0.04	0.11	0.05	0.06	0.06	0.05	0.07	0.07
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	1800	1900	3400	1900	1900
c, Capacity [veh/h]	67	2277	1429	189	2346	1173	136	148	390	223	223
d1, Uniform Delay [s]	49.65	10.18	4.28	48.56	8.64	8.11	47.74	47.50	43.21	44.19	44.03
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
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
d2, Incremental Delay [s]	6.43	0.32	0.60	3.56	0.17	0.14	9.71	8.32	0.70	2.95	2.63
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	0.53	0.29	0.32	0.64	0.18	0.09	0.79	0.77	0.41	0.63	0.60
d, Delay for Lane Group [s/veh]	56.08	10.50	4.88	52.12	8.80	8.25	57.45	55.83	43.91	47.14	46.66
Lane Group LOS	E	B	A	D	A	A	E	E	D	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.01	3.19	2.35	1.57	1.73	0.80	3.06	3.23	1.94	3.60	3.42
50th-Percentile Queue Length [ft/ln]	25.31	79.82	58.77	39.24	43.23	19.93	76.38	80.67	48.50	90.04	85.47
95th-Percentile Queue Length [veh/ln]	1.82	5.75	4.23	2.83	3.11	1.44	5.50	5.81	3.49	6.48	6.15
95th-Percentile Queue Length [ft/ln]	45.56	143.68	105.78	70.63	77.81	35.88	137.48	145.20	87.29	162.07	153.85

Movement, Approach, & Intersection Results

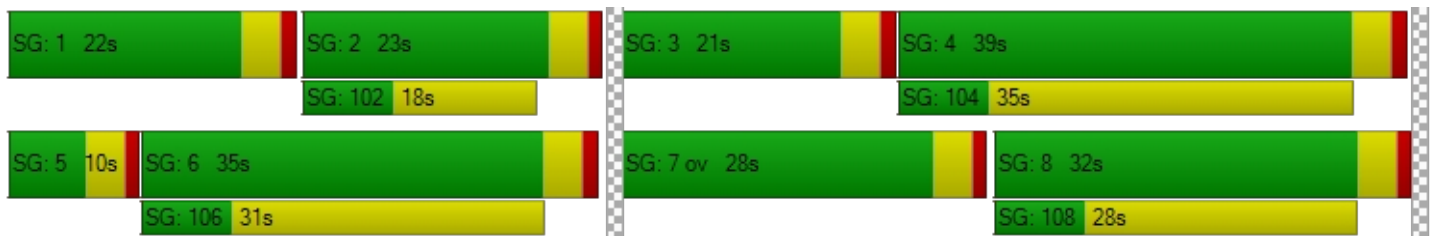
d_M, Delay for Movement [s/veh]	56.08	10.50	4.88	52.12	8.80	8.25	57.45	55.83	55.83	43.91	47.14	46.86
Movement LOS	E	B	A	D	A	A	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	9.66			16.91			56.61			45.80		
Approach LOS	A			B			E			D		
d_I, Intersection Delay [s/veh]	22.25											
Intersection LOS	C											
Intersection V/C	0.450											

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]	42.08			42.08			42.08			42.08		
I_p,int, Pedestrian LOS Score for Intersection	2.940			3.018			2.121			2.697		
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]	590			362			533			667		
d_b, Bicycle Delay [s]	26.08			35.22			28.23			23.33		
I_b,int, Bicycle LOS Score for Intersection	2.509			2.088			1.926			2.281		
Bicycle LOS	B			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 1: Shady View Drive at Mystic Canyon Drive

Control Type:	All-way stop	Delay (sec / veh):	8.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.255

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	73	1	49	121	35	40	16	6	0	3	49
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	73	1	49	121	35	40	16	6	0	3	49
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	19	0	13	32	9	11	4	2	0	1	13
Total Analysis Volume [veh/h]	1	77	1	52	127	37	42	17	6	0	3	52
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	811	847	761	876
Degree of Utilization, x	0.10	0.25	0.09	0.06

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	1.01	0.28	0.20
95th-Percentile Queue Length [ft]	8.07	25.34	6.99	5.02
Approach Delay [s/veh]	7.92	8.70	8.18	7.39
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	8.29			
Intersection LOS	A			

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

Control Type:	Signalized	Delay (sec / veh):	133.0
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.880

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]	50	0	221	1110	129	114	0	453	101	262	273	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]	50	0	221	1110	129	114	0	453	101	262	273	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]	13	0	58	292	34	30	0	119	27	69	72	0
Total Analysis Volume [veh/h]	53	0	233	1168	136	120	0	477	106	276	287	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 in	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	25	0	60	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	
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	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]	31	31	31	31	31	21	21	21	46
g / C, Green / Cycle	0.26	0.26	0.26	0.26	0.26	0.18	0.18	0.17	0.38
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.36	0.36	0.06	0.15	0.15	0.15	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	1900	1900	1800	3800
c, Capacity [veh/h]	468	494	468	468	494	334	334	308	1445
d1, Uniform Delay [s]	33.90	37.50	44.45	44.45	35.12	48.19	48.19	48.73	24.95
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.17	0.17	0.17	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]	0.49	3.21	189.93	189.93	1.17	10.46	10.46	13.10	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	0.11	0.47	1.39	1.39	0.24	0.87	0.87	0.90	0.20
d, Delay for Lane Group [s/veh]	34.39	40.71	234.39	234.39	36.29	58.65	58.65	61.82	25.01
Lane Group LOS	C	D	F	F	D	E	E	E	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.24	6.17	38.31	38.31	2.92	9.21	9.21	8.97	2.67
50th-Percentile Queue Length [ft/ln]	31.03	154.19	957.70	957.70	73.05	230.28	230.28	224.31	66.77
95th-Percentile Queue Length [veh/ln]	2.23	10.24	57.51	57.51	5.26	14.19	14.19	13.88	4.81
95th-Percentile Queue Length [ft/ln]	55.86	256.01	1437.64	1437.64	131.49	354.72	354.72	347.12	120.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.39	0.00	40.71	234.39	234.39	36.29	0.00	58.65	58.65	61.82	25.01	0.00
Movement LOS	C		D	F	F	D		E	E	E	C	
d_A, Approach Delay [s/veh]	39.54			217.69				58.65		43.06		
Approach LOS	D			F				E		D		
d_I, Intersection Delay [s/veh]	132.96											
Intersection LOS	F											
Intersection V/C	0.880											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		11.0		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]	49.50		49.50		49.50		0.00
I_p,int, Pedestrian LOS Score for Intersection	2.259		2.550		2.526		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		350		1350
d_b, Bicycle Delay [s]	54.15		40.84		40.84		6.34
I_b,int, Bicycle LOS Score for Intersection	1.560		3.909		2.041		2.024
Bicycle LOS	A		D		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):	10.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.330

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]	193	42	71	575	500	81
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]	193	42	71	575	500	81
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]	51	11	19	151	132	21
Total Analysis Volume [veh/h]	203	44	75	605	526	85
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 in	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]	12	12	70	70	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]	1800	1900	1800	3800	1900	1900
c, Capacity [veh/h]	249	263	1383	2936	1274	1274
d1, Uniform Delay [s]	37.66	34.20	2.43	2.77	5.82	5.82
k, delay calibration	0.11	0.11	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.34	0.30	0.07	0.16	0.44	0.44
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	0.81	0.17	0.05	0.21	0.24	0.24
d, Delay for Lane Group [s/veh]	43.99	34.50	2.50	2.93	6.27	6.27
Lane Group LOS	D	C	A	A	A	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.76	0.87	0.19	0.83	1.85	1.85
50th-Percentile Queue Length [ft/ln]	119.02	21.81	4.86	20.66	46.29	46.29
95th-Percentile Queue Length [veh/ln]	8.34	1.57	0.35	1.49	3.33	3.33
95th-Percentile Queue Length [ft/ln]	208.48	39.26	8.74	37.19	83.32	83.32

Movement, Approach, & Intersection Results

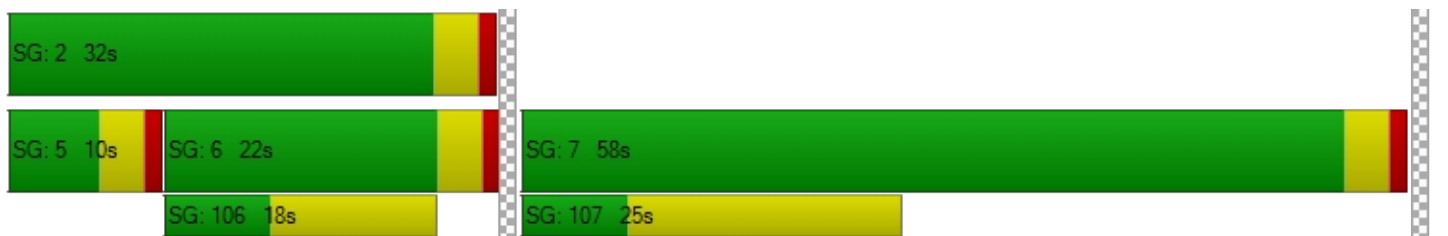
d_M, Delay for Movement [s/veh]	43.99	34.50	2.50	2.93	6.27	6.27
Movement LOS	D	C	A	A	A	A
d_A, Approach Delay [s/veh]	42.30		2.88		6.27	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	10.56					
Intersection LOS	B					
Intersection V/C	0.330					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.124	2.665	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]	7.20	21.36	28.80
I_b,int, Bicycle LOS Score for Intersection	1.560	2.121	2.064
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):	47.1
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Twin Knolls Drive			Twin Knolls Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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	93	2	0	7	13	554	108	131	388	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	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	93	2	0	7	13	554	108	131	388	13
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	146	28	34	102	3
Total Analysis Volume [veh/h]	46	2	98	2	0	7	14	583	114	138	408	14
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	0.35	0.02	0.15	0.01	0.00	0.01	0.01	0.01	0.00	0.15	0.00	0.00
d_M, Delay for Movement [s/veh]	44.67	47.15	23.18	30.61	36.87	9.75	8.22	0.00	0.00	9.75	0.00	0.00
Movement LOS	E	E	C	D	E	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	2.73	2.73	2.73	0.07	0.07	0.07	0.04	0.00	0.00	0.54	0.00	0.00
95th-Percentile Queue Length [ft/ln]	68.32	68.32	68.32	1.76	1.76	1.76	0.94	0.00	0.00	13.59	0.00	0.00
d_A, Approach Delay [s/veh]	30.28			14.38			0.16			2.40		
Approach LOS	D			B			A			A		
d_I, Intersection Delay [s/veh]	4.22											
Intersection LOS	E											

Intersection Level Of Service Report

Intersection 5: Mystic Canyon Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	30.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.302

Intersection Setup

Name	Mystic Canyon Drive			Mystic Canyon Drive			Butterfield Ranch Road			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			T T T			T T T		
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]	70	6	18	2	8	38	60	590	174	12	450	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]	70	6	18	2	8	38	60	590	174	12	450	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	10	16	155	46	3	118	2
Total Analysis Volume [veh/h]	74	6	19	2	8	40	63	621	183	13	474	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 in	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	0.25	0.25	0.25	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.06	0.03	0.04	0.22	0.20	0.01	0.13	0.13
s, saturation flow rate [veh/h]	1800	1800	1800	1900	1900	1800	1900	1900
c, Capacity [veh/h]	1253	1224	303	482	482	123	482	482
d1, Uniform Delay [s]	5.59	5.43	25.91	32.05	31.38	25.18	28.62	28.61
k, delay calibration	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
d2, Incremental Delay [s]	0.12	0.06	0.34	4.84	3.12	0.37	0.80	0.79
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	0.21	0.87	0.80	0.11	0.50	0.50
d, Delay for Lane Group [s/veh]	5.71	5.50	26.24	36.89	34.50	25.56	29.42	29.40
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]	0.59	0.29	1.01	8.71	7.71	0.21	4.25	4.23
50th-Percentile Queue Length [ft/ln]	14.80	7.27	25.28	217.87	192.80	5.25	106.26	105.85
95th-Percentile Queue Length [veh/ln]	1.07	0.52	1.82	13.56	12.27	0.38	7.63	7.61
95th-Percentile Queue Length [ft/ln]	26.64	13.09	45.50	338.90	306.66	9.44	190.79	190.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.71	5.71	5.71	5.50	5.50	5.50	26.24	36.10	34.50	25.56	29.41	29.40
Movement LOS	A	A	A	A	A	A	C	D	C	C	C	C
d_A, Approach Delay [s/veh]	5.71			5.50			35.05			29.31		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	30.27											
Intersection LOS	C											
Intersection V/C	0.302											

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]	34.67			34.67			34.67			34.67		
I_p,int, Pedestrian LOS Score for Intersection	1.930			1.885			2.830			2.634		
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			1267			1267		
d_b, Bicycle Delay [s]	23.47			23.47			6.05			6.05		
I_b,int, Bicycle LOS Score for Intersection	1.723			1.642			2.275			1.966		
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):	56.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.756

Intersection Setup

Name	Butterfield Ranch Road			Butterfield Ranch Road			Pine Avenue			Pine Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
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]	38	293	344	112	690	17	3	52	80	1192	113	301
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	293	344	112	690	17	3	52	80	1192	113	301
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]	10	77	91	29	182	4	1	14	21	314	30	79
Total Analysis Volume [veh/h]	40	308	362	118	726	18	3	55	84	1255	119	317
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 in	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]	20	35	35	10	25	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	48	91	6	50	50	1	11	39	49	49
g / C, Green / Cycle	0.04	0.40	0.76	0.05	0.41	0.41	0.01	0.09	0.32	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.02	0.08	0.19	0.03	0.19	0.01	0.00	0.07	0.37	0.11	0.11
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	1800	1900	3400	1900	1900
c, Capacity [veh/h]	68	1525	1442	172	1574	787	10	172	1103	777	777
d1, Uniform Delay [s]	56.85	23.41	4.30	56.06	25.46	20.79	59.44	53.60	40.55	23.68	23.68
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
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
d2, Incremental Delay [s]	7.89	0.30	0.42	4.80	0.97	0.05	14.78	8.75	65.53	0.19	0.19
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	0.59	0.20	0.25	0.69	0.46	0.02	0.29	0.81	1.14	0.28	0.28
d, Delay for Lane Group [s/veh]	64.75	23.71	4.72	60.86	26.44	20.85	74.23	62.35	106.08	23.88	23.88
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]	1.31	2.77	2.05	1.80	7.17	0.29	0.13	4.47	25.70	4.07	4.07
50th-Percentile Queue Length [ft/ln]	32.67	69.26	51.33	45.11	179.17	7.33	3.30	111.67	642.42	101.70	101.70
95th-Percentile Queue Length [veh/ln]	2.35	4.99	3.70	3.25	11.56	0.53	0.24	7.93	36.89	7.32	7.32
95th-Percentile Queue Length [ft/ln]	58.81	124.67	92.40	81.19	288.93	13.20	5.94	198.32	922.35	183.07	183.07

Movement, Approach, & Intersection Results

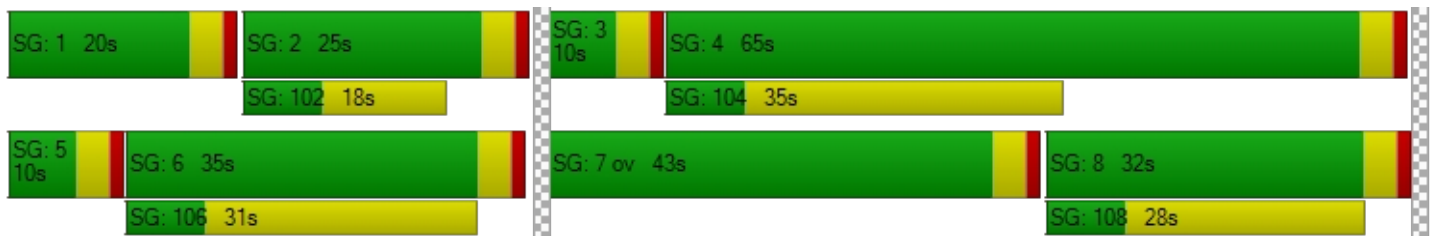
d_M, Delay for Movement [s/veh]	64.75	23.71	4.72	60.86	26.44	20.85	74.23	62.35	62.35	106.08	23.88	23.88
Movement LOS	E	C	A	E	C	C	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	16.34			31.03			62.60			84.89		
Approach LOS	B			C			E			F		
d_I, Intersection Delay [s/veh]	56.03											
Intersection LOS	E											
Intersection V/C	0.756											

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]	49.50	49.50	49.50	49.50
I_p,int, Pedestrian LOS Score for Intersection	3.218	2.988	2.092	2.949
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	350	467	1017
d_b, Bicycle Delay [s]	33.00	40.84	35.27	14.50
I_b,int, Bicycle LOS Score for Intersection	2.145	2.271	1.794	4.350
Bicycle LOS	B	B	A	E

Sequence

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



APPENDIX H-VI

**YEAR 2040 WITH PROJECT WITH MITIGATION
TRAFFIC CONDITIONS**

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

Control Type:	Signalized	Delay (sec / veh):	23.9
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

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	1	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]	59	0	433	300	28	36	0	913	35	260	446	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]	59	0	433	300	28	36	0	913	35	260	446	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]	16	0	114	79	7	9	0	240	9	68	117	0
Total Analysis Volume [veh/h]	62	0	456	316	29	38	0	961	37	274	469	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 in	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]	12.00

Phasing & Timing

Control Type	Split	Permiss	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	14	14	0	29	0	0	30	0	17	47	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	L	C
C, Cycle Length [s]	90	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	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	17	56	17	17	17	26	26	44	44
g / C, Green / Cycle	0.19	0.63	0.19	0.19	0.19	0.28	0.28	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.08	0.11	0.02	0.25	0.02	0.15	0.12
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	3800	1900	1800	3800
c, Capacity [veh/h]	337	1190	377	411	356	1083	542	572	1870
d1, Uniform Delay [s]	30.81	8.28	32.50	33.32	30.36	30.82	23.48	13.70	13.25
k, delay calibration	0.50	0.50	0.50	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]	1.20	0.94	3.21	3.80	0.60	2.68	0.05	0.62	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	0.18	0.38	0.40	0.47	0.11	0.89	0.07	0.48	0.25
d, Delay for Lane Group [s/veh]	32.01	9.22	35.71	37.12	30.96	33.50	23.54	14.33	13.32
Lane Group LOS	C	A	D	D	C	C	C	B	B
Critical Lane Group	No	Yes	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.22	4.05	3.20	4.15	0.73	9.62	0.55	3.06	2.47
50th-Percentile Queue Length [ft/ln]	30.43	101.24	79.99	103.64	18.17	240.44	13.71	76.50	61.72
95th-Percentile Queue Length [veh/ln]	2.19	7.29	5.76	7.46	1.31	14.70	0.99	5.51	4.44
95th-Percentile Queue Length [ft/ln]	54.77	182.23	143.98	186.55	32.71	367.58	24.68	137.70	111.10

Movement, Approach, & Intersection Results

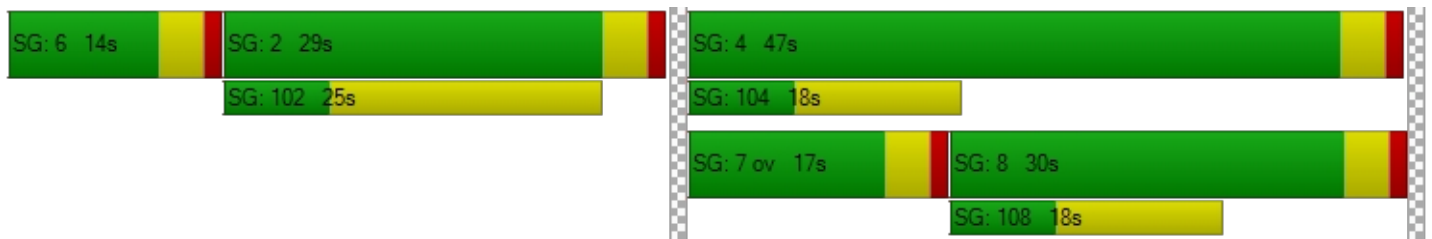
d_M, Delay for Movement [s/veh]	32.01	0.00	9.22	36.43	37.12	30.96	0.00	33.50	23.54	14.33	13.32	0.00
Movement LOS	C		A	D	D	C		C	C	B	B	
d_A, Approach Delay [s/veh]	11.95			35.94			33.14			13.69		
Approach LOS	B			D			C			B		
d_I, Intersection Delay [s/veh]	23.92											
Intersection LOS	C											
Intersection V/C	0.763											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	34.67	34.67	34.67	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.385	2.239	2.758	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	222	556	578	956
d_b, Bicycle Delay [s]	35.56	23.47	22.76	12.27
I_b,int, Bicycle LOS Score for Intersection	1.560	2.192	2.383	2.173
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 2: Shady View Drive at Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	101.5
Analysis Method:	HCM 6th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.725

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	1	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]	50	0	221	1110	129	114	0	453	101	262	273	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]	50	0	221	1110	129	114	0	453	101	262	273	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]	13	0	58	292	34	30	0	119	27	69	72	0
Total Analysis Volume [veh/h]	53	0	233	1168	136	120	0	477	106	276	287	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 in	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	Overlap	Split	Split	Split	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	6	6	6	0	2	0	0	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	-	-	-	Lead	-	-
Minimum Green [s]	6	6	6	0	6	0	0	6	0	6	6	0
Maximum Green [s]	30	30	30	0	30	0	0	30	0	30	30	0
Amber [s]	3.0	3.0	3.0	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	1.0	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	10	10	0	29	0	0	24	0	57	81	0
Vehicle Extension [s]	3.0	3.0	3.0	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	18	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	2.0	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	2.0	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	No	
Maximum Recall	No		No		No			No		No	No	
Pedestrian Recall	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	R	L	C	R	C	R	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	0.00	2.00	2.00	2.00	2.00	2.00	0.00	2.00
g_i, Effective Green Time [s]	34	78	34	34	34	18	18	40	40
g / C, Green / Cycle	0.29	0.65	0.29	0.29	0.29	0.15	0.15	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.36	0.36	0.06	0.13	0.06	0.15	0.08
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1900	3800	1900	1800	3800
c, Capacity [veh/h]	513	1232	513	513	541	567	284	468	1255
d1, Uniform Delay [s]	31.64	8.46	42.95	42.95	32.78	49.70	46.03	31.83	29.15
k, delay calibration	0.50	0.50	0.50	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]	0.40	0.34	136.67	136.67	0.94	3.45	0.82	1.19	0.09
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	0.10	0.19	1.27	1.27	0.22	0.84	0.37	0.59	0.23
d, Delay for Lane Group [s/veh]	32.04	8.80	179.62	179.62	33.72	53.15	46.85	33.02	29.24
Lane Group LOS	C	A	F	F	C	D	D	C	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.19	2.41	34.34	34.34	2.80	7.04	2.85	6.28	2.93
50th-Percentile Queue Length [ft/ln]	29.74	60.15	858.62	858.62	69.93	176.02	71.26	156.97	73.31
95th-Percentile Queue Length [veh/ln]	2.14	4.33	50.37	50.37	5.04	11.39	5.13	10.39	5.28
95th-Percentile Queue Length [ft/ln]	53.53	108.28	1259.37	1259.37	125.88	284.81	128.27	259.71	131.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.04	0.00	8.80	179.62	179.62	33.72	0.00	53.15	46.85	33.02	29.24	0.00
Movement LOS	C		A	F	F	C		D	D	C	C	
d_A, Approach Delay [s/veh]	13.11			167.32			52.01			31.09		
Approach LOS	B			F			D			C		
d_I, Intersection Delay [s/veh]	101.48											
Intersection LOS	F											
Intersection V/C	0.725											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	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]	49.50	49.50	49.50	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.324	2.550	2.619	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	417	333	1283
d_b, Bicycle Delay [s]	54.15	37.60	41.67	7.70
l_b,int, Bicycle LOS Score for Intersection	1.560	3.909	2.041	2.024
Bicycle LOS	A	D	B	B

Sequence

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

